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The Significance of the Anti-Vitamins in Nutrition[1]

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AN ANTI-VITAMIN may be defined as any substance that interferes with the synthesis or metabolism of a vitamin as, for example, by (a) inactivation or chemical destruction, (b) irreversible combination, or (c) competitive inhibition.

While instances of chemical destruction or specific binding of a vitamin have been observed and studied, by far the commonest instance of anti-vitamin action is that of competitive interference or inhibition. A full appreciation of current research in the field of anti-vitamins requires a clear conception of the phenomenon of competitive interference that is best illustrated by the following analogies. If a vitamin is imagined as a key notched and grooved to fit a particular lock, it will be appreciated that the lock can function only when the correct key is employed. An anti-vitamin that functions by competitive interference, then, may be described as a key with similar grooves but different notches. It may enter the lock but cannot turn the bolt. Furthermore, its presence in the lock prevents the correct key from functioning. In another instance a vitamin may be likened to workers constructing a building, while an anti-vitamin may be likened to a group of spectators. The spectators, although accomplishing no useful work, frequently may get in the way and obstruct operations. The potency of a compound as an inhibitor is given by a ratio of the amount of anti-vitamin (spectators) to the amount of vitamin (workers) at which normal processes are either halved or halted. It is obvious that the inhibition ratio will be low for an efficient anti-vitamin and high for one which exhibits little activity.

Vitamin research in recent years has demonstrated the essential similarity of metabolism in all forms of life. Consequently, it is not surprising that microorganisms as well as higher forms of life frequently possess limited synthetic capacities and require certain vitamins. The subject of anti-vitamins, then, may be approached from the point of view of bacterial nutrition as well as from that of human or animal nutrition. Those interested in the anti-vitamins in relation to bacterial nutrition are concerned primarily with a search for compounds useful in chemotherapy. Those interested in the nutrition of the higher forms of life are doubly concerned with the anti-vitamins both because of their possible occurrence in foods and because of their relationship to the host during therapeutic application of the anti-vitamins in disease. Wherever possible in the present review the relationship of the anti-vitamins to human nutrition has been emphasized.

NIACIN AND PELLAGRA

For many years it has been apparent that a significant correlation exists between the consumption of corn and the incidence of pellagra. Two hypotheses have been advanced in an effort to explain this observation.

One school contends that corn owes its peculiar deleterious effect to an actual *deficiency* or *imbalance* of vitamins or essential amino acids (1). The deficiency theory of the etiology of pellagra has been substantiated by two lines of evidence. First, following discovery of the anti-pellagric activity of niacin or niacinamide and development of reliable methods for the determination of these compounds, it was shown that corn contains only small amounts of the vitamin. Second, the protein quality of corn is quite poor, primarily because of a deficiency of tryptophane and lysine.

A second hypothesis attributes the pellagragenic activity of corn to the existence in it of a *toxic material* or *anti-vitamin* (2). This hypothesis is supported by the finding that in certain areas of the world, there is little pellagra despite the widespread consumption of diets containing less niacin than that contained in an all-corn diet of equivalent caloric content.

[1] Received for publication February 1, 1946.

A series of papers by Krehl *et al.* (3–7) have supplied some evidence that part, at least, of the pellagragenic activity of corn is due to an imbalance of amino acids. These studies have shown that either niacin or tryptophane may counteract the toxic action of corn, that corn is not deleterious when fed with proteins of high tryptophane content and high biological value, and that certain proteins of poor biological value are improved by niacin as well as tryptophane. Apparently certain unfavorable amino acid combinations may in a sense be considered "anti-vitamin" since they increase the dietary requirement for niacin. Recent evidence indicates that part, but not all, of the "toxic" effect of gelatin may be correlated with its content of glycine (8, 9). In one study Groschke and Briggs recently found (8) that a concentration of glycine as high as 6 per cent could be tolerated by chicks provided sufficient niacin also was furnished. Glycine cannot be responsible for the inhibitory effect of corn, however, since corn proteins are poor in this amino acid.

Recent balance experiments have shown that niacin and tryptophane probably are interchangeable in metabolism in the sense that one may be derived from the other (10–12).

The toxic hypothesis in the etiology of pellagra has received considerable substantiation, particularly from the experiments of Woolley. In 1938 shortly after the discovery that niacin would cure blacktongue, the canine counterpart of pellagra, Woolley demonstrated (13) that 3-acetylpyridine was extremely lethal to deficient dogs but that it was innocuous for normal animals. This observation lay dormant for some years until the antivitamin concept had become more fully established. In 1945 Woolley demonstrated (14) that the administration of 3-acetylpyridine to mice led to the production of a disease characterized by many of the signs seen in niacin-deficient dogs and humans. When sufficient quantities of niacin were given, the signs of the disease did not appear. Since Krehl *et al.* (6) had shown that the deleterious effect of corn could be overcome for rats either by niacin or tryptophane, it was of particular significance to note that Woolley subsequently demonstrated (15) that tryptophane and niacin possessed equal activity in reversing the disease brought about by feeding 3-acetylpyridine to mice. When the pellagragenic activity of corn had been duplicated with a structural analogue of niacin, both with respect to symptoms and their reversal with niacin or tryptophane, it became of interest to examine corn for the presence of a naturally-occurring antiniacin. The existence of such a pellagragenic compound in corn has been demonstrated by Woolley (16). A 100,000-fold concentration of activity has been achieved and maximal growth inhibition in mice was obtained with as little as 1 mg. per 100 gm. of ration. Of particular significance in practical dietetics is the report that commercial corn oil is not deleterious.

Recently it has been reported (17) that the feeding of indoleacetic acid, a naturally-occurring plant growth hormone, results in disease signs similar to those seen with corn, and it has been postulated that indoleacetic acid is the toxic factor of corn. Obviously, identification of the factor must await its isolation and characterization.

FOLIC ACID, PARA-AMINOBENZOIC ACID, AND THE SULFONAMIDES

The successful use of the sulfonamides in medicine has stimulated considerable inquiry into the mechanism of their action. In 1940 Woods and Fildes (18) demonstrated *in vitro* that para-aminobenzoic acid has anti-sulfonamide activity. A widely accepted theory of sulfonamide action then was put forth by Fildes (19). According to his thesis, para-aminobenzoic acid is considered an essential metabolite or compound that functions in some fundamental manner in all cells. The sulfonamides were believed to function by interfering competitively with para-aminobenzoic acid metabolism. The theory has had considerable substantiation in fact. For example, the inhibitory action of the sulfonamides may be nullified for most, but not all, organisms with para-aminobenzoic acid. In addition, it may be shown that certain staphylococci, on becoming sulfonamide-resistant, synthesize sufficient para-aminobenzoic acid to neutralize the inhibitory effect of the sulfonamide concentration to which they have become acclimated (20, 21).

Several recent investigations now indicate that the theory of Fildes is only partially correct in its attempt to explain the mechanism of action of the sulfonamides. *In vitro* studies have shown that certain bacteria synthesize extra folic acid when supplied with para-aminobenzoic acid (22). Miller has shown (23) that sub-bacteriostatic amounts of sulfanilamide markedly inhibit folic acid synthesis by *Escherichia coli*. With the elucidation of the folic acid structure (24), it became apparent that para-aminobenzoic acid was a moiety of the folic acid molecule. Lampen and Jones demonstrated (25, 26) that organisms requiring a source of preformed folic acid for growth are essentially refractory to sulfonamide inhibition. The data from these divergent sources, therefore, strongly indicate that the function of sulfonamides in inhibiting microorganisms is that of competitive interference with folic acid synthesis.

Nutritionists have long been aware that microorganisms of the intestinal tract are capable of synthesizing vitamins that presumably may be absorbed and utilized by the host.

With the development of the poorly absorbed sulfonamides, sulfanylylguanidine ("Sulfaguani-

dine"), succinylsulfathiazole ("Sulfasuxidine"), and phthalylsulfathiazole ("Sulfaphthalidine"), a practical means of modifying the intestinal flora or altering the microbiologic activity in the intestine appeared available.

The poorly absorbed or "intestinal sulfonamide" that has been most extensively studied with respect to its role in nutrition is succinylsulfathiazole. It has been abundantly demonstrated that its administration in large amounts to animals receiving *crude* or *natural* or *commercial* diets is without deleterious effect. For example, in one study, Wright and Skeggs (27) administered succinylsulfathiazole to growing rats over an eight-week period in a dose which, in comparison with the prescribed human dose, was approximately three times greater on the basis of per cent of food intake and twenty to forty times greater on the basis of grams per kilogram of body weight. The growth, general appearance, hepatic storage of biotin and pantothenic acid, and fecal elimination of biotin, pantothenic acid, and niacin were not influenced significantly by the ingestion of the sulfonamide. The animals consuming the sulfonamide-containing diet eliminated significantly less folic acid in the feces and at the conclusion of the experiment were found to have significantly less folic acid stored in the liver. The hepatic storage of folic acid was, however, approximately three times that found in rats receiving adequate highly purified diets and eight to ten times that found in folic acid-deficient animals. The *Escherichia coli* organisms were practically eliminated from the feces of the succinylsulfathiazole-fed rats.

In contrast, a variety of deficiency signs (poor growth, alopecia, spectacled eye, porphyrin-stained whiskers, achromotrichia, leucopenia, and agranulocytosis) is seen when the poorly-absorbed sulfonamides—sulfaguanidine, succinylsulfathiazole, or phthalylsulfathiazole—are administered to rats receiving *highly purified* diets containing the B-complex (thiamine, riboflavin, niacin, pantothenic acid, and pyridoxine) ordinarily satisfactory for promoting good growth (28–32). Investigations in several laboratories led almost simultaneously to the demonstration that folic acid and biotin were effective in counteracting the deficiency induced by feeding succinylsulfathiazole (29, 32, 33). It is now quite possible to rear rats on *highly purified* diets containing succinylsulfathiazole when folic acid and biotin are provided simultaneously. Recently it has also been demonstrated (34) that chicks may be reared satisfactorily on a highly purified diet containing succinylsulfathiazole provided sufficient folic acid is supplied. In fact, the succinylsulfathiazole-fed chicks showed somewhat superior growth.

Since the action of the sulfonamides appears to be that of interfering with folic acid synthesis by bacteria, it is apparent that for a sulfonamide to be clinically effective it must, among other attributes, be an effective anti-vitamin or inhibitor of folic acid synthesis.

BIOTIN

Avidin (anti-biotin), a specific protein of egg white, affords a unique instance of a naturally-occurring substance capable of combining with a vitamin to render it unavailable. One molecule of avidin combines stoichiometrically with one molecule of biotin to give a complex not broken down in the process of digestion. Heat denaturation of egg white destroys the biotin-combining capacity of avidin.

The chance that a biotin deficiency will be induced by the ingestion of raw eggs in any reasonable amount is, however, so remote as to be non-existent, even though there is insufficient biotin in the yolk of an egg to counteract the avidin activity of the white (35). The consumption of extremely large amounts of egg white in conjunction with other highly purified ingredients is essential for the development of a biotin deficiency in humans. For example, Sydenstricker *et al.* (36) in their successful production of biotin deficiency in humans fed a diet in which desiccated but undenatured egg white constituted 30 per cent of the total caloric intake. Rhoads and Abels (37) fed to two patients for a period of thirty weeks from forty to sixty times the amount of avidin necessary to bind the limited quantities of biotin supplied in a semi-purified diet. No clinical evidence of a biotin deficiency was induced nor did the urinary elimination of biotin fall. Presumably previous tissue storage of biotin or synthesis of the factor by microorganisms of the intestinal tract were factors in preventing the occurrence of a definite biotin deficiency.

Several anti-biotin derivatives that are capable of inhibiting the utilization of biotin by microorganisms have been synthesized (Table 1). Although several compounds have shown encouraging activity *in vitro*, none as yet have been employed in human therapy.

THIAMINE

The feeding of raw fish to foxes and other animals leads to the production of a thiamine deficiency ("Chastek paralysis") (38). Investigation has shown that the deleterious agent in raw fish is an enzyme that splits the thiamine molecule into its pyrimidine and thiazole moieties (39–41). Since heating destroys the activity of the thiamine-inactivating enzyme, the factor has no importance in human nutrition.

Recently it has been shown by Weswig, Freed, and Haag that a naturally-occurring anti-thiamine exists in certain ferns (42). It is not known whether the anti-thiamine material inactivates thiamine, combines with it to render it unavailable, or com-

TABLE 1

The anti-vitamin activity of various compounds

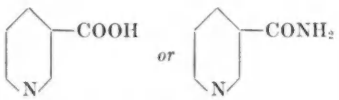
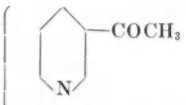
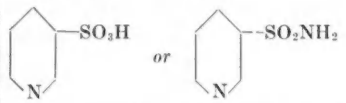
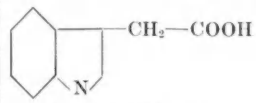
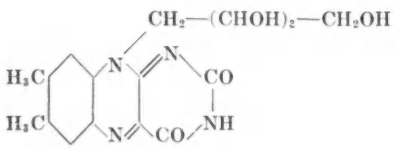
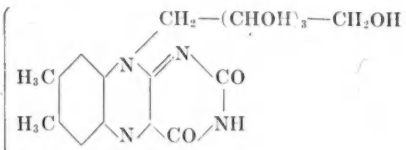
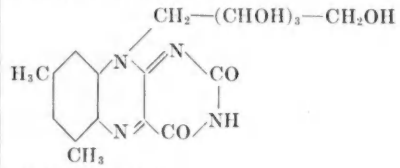
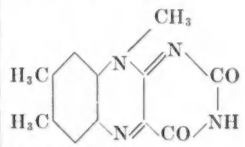
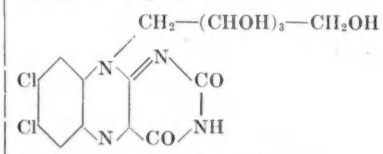
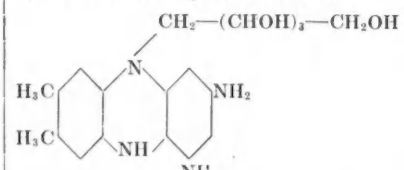
VITAMIN	ANTI-VITAMIN
 Niacin or niacinamide	 β-Acetyl pyridine (14)
	 Pyridine-3-sulfonic acid or amide (60)
	 Indoleacetic acid (17)
	Naturally-occurring anti-niacin compound (16)
 Riboflavin	 Galactoflavin (71)
	 Isoriboflavin (72)
	 Lumiflavin (43, 44)
	 6,7-Dichloro-9-ribityl-iso-alloxazine
	 2,4-diamino-7,8-dimethyl-10-ribityl-5,10-dihydrophenazine (74)

TABLE 1—*Continued*

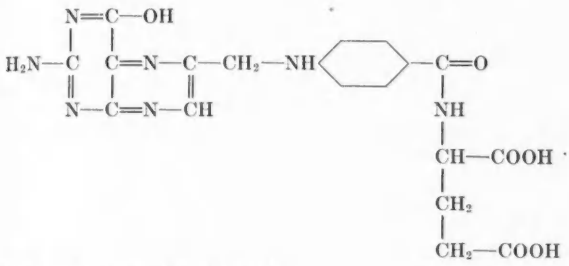
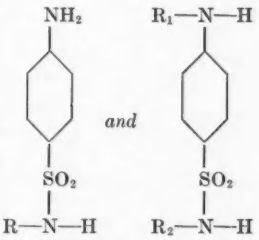
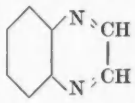
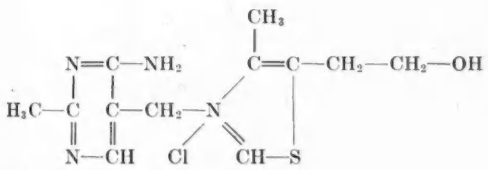
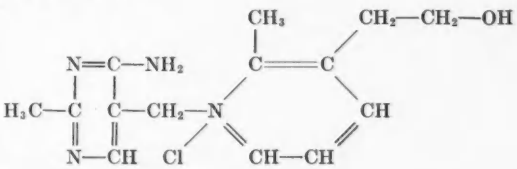
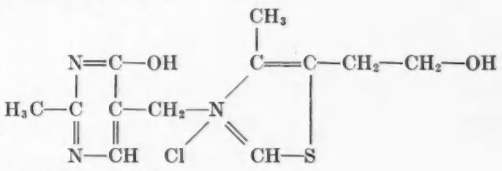
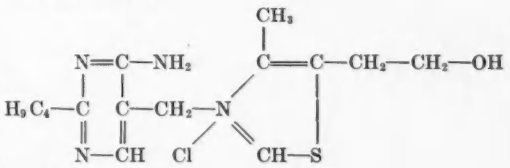
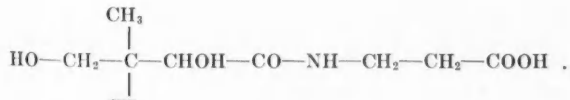
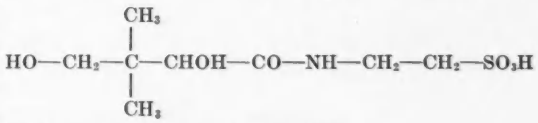
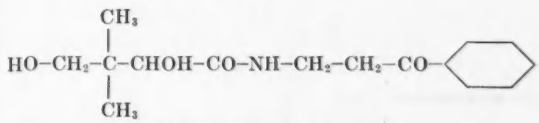
VITAMIN	ANTI-VITAMIN
 Folic acid (pteroylglutamic acid)	 Sulfonamides (23, 26)
	 Quinoxaline (61)
 Thiamine	 Pyrithiamine (68)
	 Oxythiamine (69)
	 Butylthiamine (70)
	Naturally-occurring anti-thiamine compound (42)
	Naturally-occurring thiamine-destroying enzyme (38–41)
 Pantothenic acid	 Pantoyltaurine (10, 11, 45, 46, 75, 79)
	 Phenyl pantothenone (76)
	Various condensation products involving pantoyl lactone (see 77 for summary)

TABLE 1—*Continued*

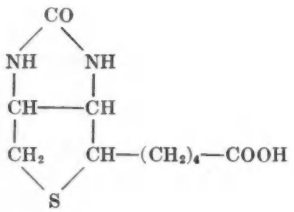
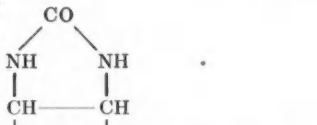
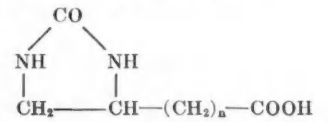
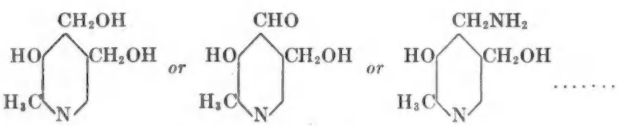
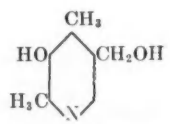
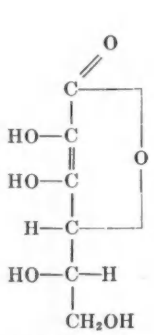
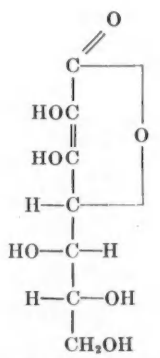
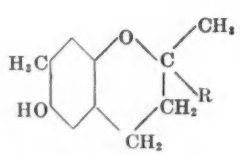
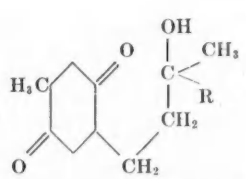
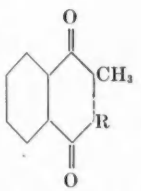
VITAMIN	ANTI-VITAMIN
 Biotin	 Desthiobiotin (62, 63)  ω-imidazolidonecarboxylic acids (64) n = 4 = Imidazolidonevaleric acid n = 5 = Imidazolidonecaproic acid Biotin sulfone (64) Various urylenecyclohexyl and urylenebenzene derivatives (65) Avidin (66, 67)
 Pyridoxine, pyridoxal, or pyridoxamine	 2,4-Dimethyl-3-hydroxy-5-hydroxymethylpyridine (49)
 Ascorbic acid	 Glucoascorbic acid (56–58)
 Vitamin E and vitamin K	 α-Tocopherol quinone (50)

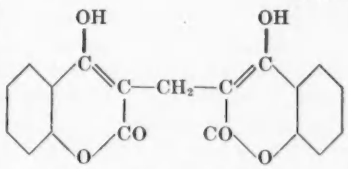
TABLE 1—*Continued*

VITAMIN

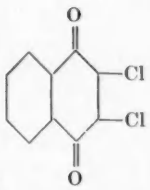
ANTI-VITAMIN



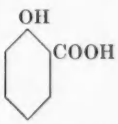
Vitamin K



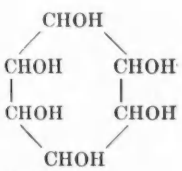
3,3′- Methylenebis-(4-hydroxycoumarin) (51)



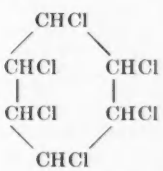
2,3-Dichloro-1,4-naphthoquinone (54)



Salicylic acid (52)



Inositol



γ-Hexachlorocyclohexane (59)

petitively interferes with its action. Whether this or related anti-thiamines exist in products consumed by humans is not known.

Several synthetic anti-thiamines have been made that have been shown to inhibit utilization of thiamine by microorganisms or higher species (Table 1).

RIBOFLAVIN

Several analogues of riboflavin that interfere with the utilization of the vitamin in microorganisms or animals have been synthesized (Table 1).

Light inactivates riboflavin and leads to the formation of lumiflavin in alkaline solution or lumichrome in neutral or acid solution. Sarett has shown (43, 44) that lumiflavin under certain conditions has anti-riboflavin activity for *Lactobacillus casei*. Lumichrome apparently has not been examined for anti-riboflavin activity.

PANTOTHENIC ACID

There are no known naturally-occurring anti-pantothenic acid substances. There have been a great abundance of synthetic pantothenic acid derivatives made in an effort to find a useful chemotherapeutic derivative (Table 1). The majority of these pantothenic acid analogues have involved the condensation of pantoyl lactone with compounds containing a primary or secondary amino group. Pantoyltaurine and phenyl pantothenone have shown some promise. Contrary to one published report, pantoyltaurine does not inhibit the growth of animals under the conditions studied (45, 46). It is difficult to maintain blood levels of pantoyltaurine sufficiently high for an effective inhibition ratio to be maintained (47). Phenyl pantothenone is as active as quinine against certain forms of malaria (48).

PYRIDOXINE

There are no known naturally-occurring anti-pyridoxine derivatives. A synthetic derivative of pyridoxine, 2,4-dimethyl-3-hydroxy-5-hydroxymethylpyrimidine, has been shown to inhibit utilization of pyridoxine in the chick (49). Two molecules of the inhibitor will offset the vitamin activity of one molecule of pyridoxine (inhibition ratio of 2). The compound is, therefore, one of the most, if not *the* most, potent anti-vitamins known.

VITAMINS E AND K

Woolley, in an attempt to find an anti-vitamin or inhibitory structural analogue of vitamin E, fed α-tocopherol quinone to pregnant mice (50). Resorptive interruption of pregnancy ensued. The condition could not be prevented by α-tocopherol but vitamin K was effective. A certain structural similarity is present in the formulae of α-tocopherol, α-tocopherol quinone, and vitamin K. Accordingly, α-tocopherol quinone may be considered as an anti-vitamin of both vitamin E and K since the condition elicited by its administration is similar to a deficiency of vitamin E but vitamin K is required for its reversal.

Link and co-workers have isolated from spoiled sweet clover a compound, 3,3′-methylenebis-(4-hydroxycoumarin), capable of inducing hypoprothrombinemia in various species (51). The action of the compound is nullified by sufficient intake of vitamin K. Dicoumarin may be degraded to salicylic acid (52), and experiments of Link *et al.*, as well as subsequent clinical reports, have demonstrated the anti-vitamin K activity of the salicylates. The administration of vitamin K during intensive salicylate therapy is accompanied by a decreased tendency to hypoprothrombinemia without concomittant reduction in effectiveness of the salicylates (53).

The anti-microbial action of 2,3-dichloro-1,4-naphthoquinone may be reversed competitively by vitamin K in the case of yeast but not with bacteria (54). The occurrence of vitamin K in certain bacteria and its essential nature for the Johne's bacillus (55) are additional evidence that vitamin K probably is an essential metabolite in all forms of life.

ASCORBIC ACID

Glucoascorbic acid, a homologue of ascorbic acid, has been fed by Woolley and Krampitz (56) to mice and cotton rats in an attempt to inhibit competitively synthesis or metabolism of ascorbic acid and thus produce a condition of scurvy in these two species that thrive on diets devoid of the vitamin. A disease having many of the characteristics of scurvy as seen in the guinea pig and primates was thus produced. The condition was not cured by the administration of ascorbic acid, but the scurvy-like signs were relieved by plant products rich in the vitamin. Subsequently Woolley has reported (57) that the administration of glucoascorbic acid to guinea pigs was accompanied by typical signs of scurvy. Furthermore, in this species, the deleterious effect of glucoascorbic acid was found to be relieved with ascorbic acid. Banerjee and Elvehjem have fed glucoascorbic acid to rats, chicks, and guinea pigs (58) in an attempt to confirm the findings of Woolley. While the feeding of glucoascorbic acid to rats was found to be deleterious, no scurvy-like signs were seen. The severe diarrhea and weight loss observed in guinea pigs was not prevented by ascorbic acid but was prevented with liver powder. These workers felt that the glucoascorbic acid functioned, not as an anti-vitamin C, but by preventing synthesis of some material supplied by the intestinal flora and present in liver.

INOSITOL

The insecticidal action of γ-hexachlorocyclohexane has been postulated to be due to an interference, or anti-vitamin action, on the inositol metabolism of the insect. That the compound has anti-inositol activity has been demonstrated with *Saccharomyces cerevisiae* which requires inositol as a vitamin (59). With this species the inhibitory action of the compound is completely reversed by inositol.

SUMMARY

The major anti-vitamins that have been described, isolated, or synthesized in recent years had been discussed or summarized. Certain of the synthetic anti-vitamins have been usefully employed or show promise as inhibitors or chemotherapeutically active substances. Other anti-vitamins of a deleterious nature have been observed to occur naturally in foods consumed by human beings. The mechanisms of action of the anti-vitamins of practical concern in human dietetics have been discussed.

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Skin Diseases and Vitamin A

Much effort has been devoted recently to studying the possible connection between certain skin diseases and the levels of vitamin A in the blood plasma. Two British investigators determined the plasma vitamin A levels in 116 dermatologic patients and compared them with 116 control patients. A mean value of 116 I.U. of plasma was found in patients with skin disease, and this was virtually identical with the mean value of 113 I.U. found in the controls. Some support was found for the theory that secondary deficiency of vitamin A might be of some significance in a few rare skin diseases. In six cases of Darier's disease, two of pityriasis rubra pilaris, and three of ichthyosis, the mean level of vitamin A in the plasma was 77 I.U. In patients with Darier's disease and pityriasis rubra pilaris the administration of large doses of vitamin A concentrate resulted in an eventual plasma vitamin A level considerably above normal values. In two of the patients with Darier's disease the skin became normal or nearly so after treatment with vitamin A and grenz rays. The other patients with Darier's disease showed less improvement, and in one, the lesions remained unchanged even when the vitamin A levels in the plasma reached high levels. Two of the patients with pityriasis rubra pilaris showed some, but incomplete, improvement of the skin when the plasma vitamin A levels reached normal or higher than normal levels. It would seem from these and other studies that the relation between the amounts of vitamin A in the blood plasma and the appearance of the skin lesions in several rare dermatologic conditions might be of a significance, though in the vast majority of skin diseases there is little or no direct relationship.—*From Current Comment, J. A. M. A. 132: 583, 1946.*

"Unrestricted Diet" in the Treatment of Juvenile Diabetes[1]

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THE TERM "unrestricted diet" undoubtedly suggests to many an abandonment of certain tenets of faith in well-established dietary codes. Unfortunately the term is ambiguous and has some connotations and implications beyond the intent of the proponents of the regime it designates; yet it is difficult to find a better term for our purpose. It is well, therefore, to begin with definitions, and to attempt a brief analysis of what has been meant by several terms that are commonly used more or less synonymously with and in contrast to this one.

In diabetic circles the term "prescribed diet" has a well-accepted meaning, signifying that the food of each meal is to be weighed or measured to give, according to standard tables, a certain number of calories from a specified number of grams of carbohydrate, protein, and fat. The words "free" or "unrestricted" are used to designate a more or less self-selected, unmeasured diet, but they do not mean in practice complete freedom of choice, which, of course, is not attainable within the limits of the usual family dietary, or at least not practicable in daily marketing even in times of abundance. The most that is meant by those who are recommending the so-called free or unrestricted diet for the diabetic child, contrasted with the strictly measured diet, is the freedom to eat—without feeling guilt—the foods the non-diabetic child eats and, approximately, in the same manner. In the Cincinnati Children's Hospital, the dietary recommendations for diabetic children who are placed on the unrestricted regime are approximately the same as for non-diabetic healthy children of the same age, but with more advice on general principles of normal nutrition than is usually given to families of non-diabetic patients. We are convinced that if good foods are available in desirable variety, appetite will usually govern fairly satisfactorily the amount and type of food that is taken both by the non-diabetic child and by the diabetic child who is receiving insulin in proper amount. This conviction, of course, does not preclude judicious supervision of the child's food habits. While everyone agrees that obesity with diabetes should be avoided, it is doubtful whether the tendency to obesity is any more frequent among diabetic children than among the non-diabetic. In any case, the necessity for limitation of the food intake to avoid overweight in the obese type is the same in both cases.

For the diabetic child's well-being, the most important desideratum is the adjustment of insulin dosage and food intake to assure full normal activities and normal growth and to avoid the inconvenient, unpleasant, and even dangerous reactions of hypoglycemia. The complication most to be feared is the development of acidosis and coma. No one should even attempt to treat diabetes in young children by dietary restrictions without the use of insulin. With insulin, the food intake must afford adequate calories for energy output and adequate elements for normal growth. The body's demands for growth cannot be left unsatisfied without some sacrifice to general health. The body, of course, has the ability to draw its calories from carbohydrates, fats, or proteins according to the supply, but the manner in which these foodstuffs are converted to energy and body stores depends upon the action of insulin and other accessory factors in the intermediary metabolism.

With regard to the complications of acidosis and coma, there is increasing acceptance of the premise that the diabetic patient is not thrown into acidosis by dietary indiscretion in the sense of overeating within the limits of appetite, but by insufficient insulin. The onset of acidosis and coma in the juvenile diabetic can be ascribed invariably to factors of infections and/or failure to increase the dose of insulin as needed during infections,

[1] Presented at the 29th Annual Meeting of the American Dietetic Association on October 17, 1946, in Cincinnati.

or to a decreased dose or total omission of the insulin. When this concept is accepted, the main problem is to find ways of adjusting the daily dose of insulin to fit varying needs. While this problem is not primarily the concern of the dietitian, it is essential that it be discussed in connection with any proposed scheme for diabetic care.

The theory of dietary restrictions to control diabetes mellitus is based largely on investigations made in the pre-insulin era. The history of dietary management of diabetes has been thoroughly reviewed by Jost (1), who traced the changing dietary practices through the Naunyn and Allen eras to the present time when diets commonly prescribed (for adults) may have 3.5 to 4.0 gm. carbohydrate, 1 gm. protein, and 0.5 gm. fat per kilogram body weight, which is essentially the normal dietary ratio in this country. Objections to this generous regime are still heard, however, and there remains a widespread reluctance to give up some of the principles of treatment formulated in the pre-insulin era. It should be borne in mind that all of the earlier dietary regimes were evolved largely on the basis of empiric trial. While each appeared to have its merits in the period and under the circumstances of its adoption, it is difficult to discern at present a really firm scientific basis for any one of them.

The so-called free diet is merely another step beyond the now widely accepted high-carbohydrate diet; but before adopting that diet, one must, of course, weigh the objections to it. The concomitant problem of the pathologic significance of persistent hyperglycemia, which the proponents of the free diet generally allow, should also be considered. An unmeasured diet and somewhat irregular food intake necessitates an adjustment in insulin dosage to permit fairly continuous glycosuria as a protection against hypoglycemic insulin reactions. Arguments regarding the harmfulness of a high-carbohydrate diet and against allowing persistent hyperglycemia are usually based on Allen's experiments (2) in which he showed that a partially depancreatized dog, if fed a high-carbohydrate diet, exhibited progressive degeneration of the remaining islands of the pancreas and eventually developed frank manifestations of diabetes. This argument is of doubtful value when insulin is available to the human diabetic, since the administration of insulin in proper dosage creates a changed physiologic situation in which the defects of diabetic metabolism are nearly if not completely abolished. To state the case simply, the diabetic subject with hyperglycemia who is receiving insulin in a minimal but sufficient amount to promote glycogenesis is not at all the same, physiologically, as the diabetic with the same degree of hyperglycemia who is receiving no insulin or an insufficient amount.

Many investigators have claimed in the past that an excessive carbohydrate intake is a factor precipitating acidosis in the diabetic. When he enters the hospital in coma, dietary indiscretions are often blamed for the break in control. Critical experimental tests of this assumption were reported in 1941 by Mirsky and co-workers (3). They presented convincing evidence that the sudden development of hyperglycemia resulting from increased ingestion of carbohydrate does not of itself precipitate acidosis and coma if minimal requirements of insulin are met. Some of the subjects of those tests were patients in the Children's Hospital. One, a boy of fifteen years, was given a minimal dose of insulin which, on his standard diet, permitted glycosuria with a faint trace of acetonuria. During a period of two weeks with the dose of insulin unchanged, increasing amounts of carbohydrate were added to his diet until he was receiving approximately 850 gm. of carbohydrate per day. During the period of high-carbohydrate feeding, there was markedly increased glycosuria and the blood sugar was constantly around 700 mg. per 100 cc. with rises to around 1000 mg. per 100 cc. There was, however, no increase in acetonuria, and the boy suffered no apparent ill effects. On the other hand, irrespective of diet in this patient and in others similarly studied, deprivation of insulin led rapidly to ketosis and to the appearance of signs and symptoms associated with acidosis: weakness, excessive thirst, marked polyuria, nausea, vomiting, and progressive dehydration. Such evidence indicates convincingly that lack of insulin, not the ingestion of excessive amounts of carbohydrate, is the precipitating cause of diabetic coma.

The action of insulin in promoting the assimilation of food elements has been compared to that of some of the vitamins. Many examples of such action of the accessory food factors might be cited, but one will suffice for illustration. The high calcium-low phosphorus or low calcium-high phosphorus diets employed to produce rickets experimentally in rats are rachitogenic only if vitamin D is withheld from the diet; if minimal amounts of vitamin D are supplied with the same diets, the available minerals are absorbed and stored in the body tissues, and healing of rickets occurs despite grossly abnormal proportions of calcium and phosphorus in the diet. It is apparent that insulin similarly enables the body to assimilate and metabolize normally the foodstuffs available in diets differing widely in composition. Despite the fact that the diabetic diet preferred by one expert sometimes appears to be grossly abnormal by another's standards, the use of each is attended with good results if adequate doses of insulin are used judiciously and if the diet covers the basic needs of nutrition. Successful use of the different types of diet conclusively demonstrates that the diabetic subject can get along well on almost any combination of high-protein, high-fat, or high-carbohydrate diet

if minimal requirements for protein, minerals, vitamins, and insulin are satisfied.

The free diet for diabetics has been most widely adopted in the Scandinavian countries. Lichtenstein, of Stockholm, has published an extensive review on the subject, reporting his own satisfactory experience of ten years in which he treated 169 diabetic children without dietary restrictions (4). From the outset his patients are allowed a diet corresponding in every way to that of healthy children. At the start of treatment they are given ordinary hospital fare, of which they are allowed to eat as they desire. At home they eat the family fare, like their siblings, to satisfy their individual taste within the same limits as would ordinary children. Sugar and sweets in reasonable amounts are permissible. The only restriction made is to avoid overindulgence, under rules that apply to all children. Insulin is usually given in one injection per day (Hagedorn's protamine insulin) in dosage allowing continuous mild glycosuria and adjusted to produce "a good general condition, a feeling of well-being, a satisfactory increase in weight, a moderate amount of urine, ..." Among children whose carbohydrate intake previously had been restricted, Lichtenstein says that the transition from dietetic treatment to the free regime was marked for a few days by ravenous carbohydrate hunger, but after a few days the children always reduced their consumption to a moderate amount of all foods. The children spontaneously adjusted themselves, with relatively small variations from day to day, to an intake of 80 to 100 calories per kilogram body weight per day at ages under five years, 60 to 80 calories at five to ten years, and 40 to 60 calories at ages ten to fifteen years. As a rule, the carbohydrate intake was around 6 to 7 gm.; protein, 2 to 3 gm.; and fat, 2.5 to 3.5 gm. per kilogram body weight per day—"generally a normal all-round fare, in which none of the ingredients were disproportionately increased at the expense of any of the others, as is the case with several of the proposed high-fat, high-protein, or high-carbohydrate diets."

During the past five years an increasingly full dietary regime has been gradually adopted in the Cincinnati Children's Hospital diabetic clinic.[2] Until 1942, all diabetic patients were kept on a regime that followed essentially the scheme of treatment described by Nelson (5, 6, 7). With a measured diet, insulin was administered in dosage adjusted to give minimal or no glycosuria throughout the day—usually a single dose of a mixture of protamine zinc insulin and regular insulin in the morning. On this regime, despite all efforts at nice adjustment, mild to severe hypoglycemic reactions occurred not infrequently. In 1942, while the patients were still maintained regularly on measured diets, the insulin dosage was adjusted in some cases to allow a considerable degree of glycosuria and mild hyperglycemia throughout the day, but with precautions against the development of ketosis. Encouraged by the results obtained, we then extended this practice in selected cases to allow a free choice of unmeasured diets, with general instructions and recommendations similar to those quoted from Lichtenstein's report. At present, our clinic has an enrollment of thirty-three patients, ranging in age from one and one-half to seventeen years, of whom twenty-six are taking unmeasured, "unrestricted" diets and seven still remain on measured diets.[3]

All patients in the unrestricted group and their parents have in the past experienced some discipline with prescribed measured diets. New diabetic patients also are still started with measured diets while initial instructions in diabetic care are being given to the parents, and to the child if of an understanding age. A measured diet makes easier the instruction in general principles of nutrition and diabetic control, and the effects of varying doses of insulin are, of course, more easily demonstrated while the dietary intake is kept constant from day to day. Since the measured diet is not our present concern, it need not be discussed here in detail. Suffice it to say that the dietitian offers the parents the usual lessons on principles of the prescribed diet, with instructions in the preparation and measurement of foods. With such instruction the parents and the older patients themselves are usually able to write a detailed menu following a diet prescription and standard tables of food values, or they are at least able to make substitutions of foods following examples in the varied menus furnished them by the dietitian. The usual instructions are given by nurses on the technique of administering insulin and testing the urine and by physicians on principles governing insulin dosage and general care.

Thus, when our patients are allowed the "unrestricted" dietary regime, both the patients and parents have gained some knowledge of what may be expected to happen with each change of food intake and of insulin dosage. They have also invariably gained some first-hand knowledge of the nature of insulin reactions, mild or severe, and appreciate the advantages of the more liberal glycosuric regime when it is allowed. Fairly regular food habits are usually observed after restrictions are lifted. Under this regime the child eats more when hungry and/or when there is hypoglycemia resulting from exercise plus the effects of insulin, and insulin shock is avoided without the careful attention that is required under aglycosuric regimes.

[2] From 1943 to 1945, the clinic was under the supervision of Dr. Frederick W. Barnes, Jr.

[3] Since this was written another noteworthy patient has been added to the group allowed an "unrestricted" diet, an infant born January 3, 1947, whose onset of diabetes occurred at nine days of age. At two months of age, the baby is completely breast fed, receiving approximately one unit protamine zinc insulin daily, and is gaining nicely.

It is pertinent here to say a word on the fear that the diabetic child will indulge excessively in candy or other single items of food if restraints of the prescribed diet are removed. This has not occurred in our experience nor in the much larger experience reported by Lichtenstein. When first placed on the free regime, it is true, the children have eaten considerably more than before of some of the previously limited foods. However, within a short time, when appetite and perhaps curiosity have been satisfied, they settle down to eating about like non-diabetic children. We have subsequently advised limitation of the food intake only if obesity is developing, accepting the fact that overweight is hazardous for the diabetic person.

Two or three times a year each patient is asked to keep a record of all food eaten for seven consecutive days, and these records are analyzed by the dietitian as well as the listed approximate measurements of portions permit. With such a record, one mother turned in an excellent analysis of her own, made on the basis of her past experience with the measured diet for her son. Details of these records will be reported later.

The patients test their urine for sugar two or three times a day, more or less regularly, as a check on excessive glycosuria, but beyond this the control measure that has proved most valuable in our experience is the frequent testing for acetone in the urine *at home*.[4] Again perhaps this is not primarily the concern of the dietitian, but it is an important part of the general scheme of treatment under discussion. This test is a most important aid whether the patient is on a measured diet with the urine kept sugar-free or on an unrestricted diet with glycosuria permitted at all times. It is an especially important safeguard for patients allowed to show glycosuria constantly, since suddenly increased spilling of sugar may not be readily disclosed by the qualitative tests that are performed at home. While daily testing for acetone in the urine is not necessary, our patients are told to make the test whenever there are special indications—in the presence of colds, fever, or any gastrointestinal disturbance, especially if they vomit for any reason whatever; if loss of weight is noticed; if there is thirst, polyuria, or troublesome nocturia; unusual fatigue; or, in fact, any suspicious sign of physical maladjustment. If there has been refusal of food for any reason and the acetone test is positive, the child is urged to take fruit juices or any acceptable, easily assimilable carbohydrates, with extra insulin until the acetonuria disappears. This instruction requires confidence in the judgment of the parents and patients, but that confidence has been amply justified. Mothers of young diabetic patients have learned to be quickly alert to these warnings of impending trouble, and our patients' own records show convincing examples of impending acidosis and coma which have been averted by this simple expedient. When acetonuria is found with minor physical disturbances, a small extra dose of insulin usually serves to clear up ketosis and to restore equilibrium, whereas if insulin is not given early in such circumstances, severe acidosis may develop rapidly. If "nicely regulated" diabetic patients whose urine is kept constantly sugar-free refuse food for any reason, the parents fearing insulin reactions sometimes omit insulin when, in fact, more insulin is needed, especially at the onset of acute infections. With refusal of food, the factor of starvation aggravates the development of ketosis. At such a time a positive test for acetone in the urine offers definite evidence that more insulin—and more carbohydrate—are needed.

For about ten years, a Girl Scout Camp near Cincinnati has received groups of diabetic girls from our clinic, and we have had the opportunity to observe their adjustments to various regimes followed in different years. At first the diabetic girls were kept together as a group, accompanied by a dietitian who measured their food, and for convenience they all ate at the same table apart from the others. Insulin dosage was adjusted to keep their urine sugar-free or nearly so. Under that regime, especially during the first week, there was a high incidence of hypoglycemic reactions, sometimes of considerable severity, brought on by the unaccustomed exercise. During the past two summers when eight diabetic girls who were on the unrestricted dietary regime attended this camp, they were not kept together but lived in tents or cabins with other non-diabetic girls of their own age. They participated in all camp activities and ate the same fare according to appetite and without restriction other than the general instructions which they followed at home. A dietitian accompanied them merely for the purpose of keeping an approximate record of food eaten (recorded by the girls themselves) for later analysis. The girls reported to the nurse at headquarters each morning to receive their single dose of insulin and to leave samples of urine for examination. Under this regime they got along well, and only one girl suffered a single mild insulin reaction.

Too little attention generally has been paid to psychological difficulties and behavior problems of the juvenile diabetic. While it is true that he is generally brought to dismiss ideas of physical invalidism, it is more difficult to exclude an attitude of favoritism and its consequences. The setting aside of one child in a family for special attention is a potential source of friction in family relations. It is unrealistic to fail to recognize or to deny this situation. Psychologic problems are especially apparent

[4] The simplest acetone test, especially convenient for use at home, is one such as that described by I. M. Rabinowitch, Canad. Med. J., 52: 602, 1945. Also, a powder distributed by the Denver Chemical Company, 163 Varick Street, New York may be used for this test.

when children are under the strict regime of a measured diet with insulin dosage adjusted to keep the blood sugar within a narrow range to prevent glycosuria. Under that regime many parents suffer constant worry, openly manifested or ill concealed, over the consequences of insulin reactions; also, minor infringements of the rules often provoke punitive attitudes in the parents and even in the physician to whom they look for advice. Such attitudes in turn stir resentment in the child.

We have observed many examples of behavior difficulties, manifested in temper tantrums and other emotional disturbances, apparently resulting from mild, almost inapparent hypoglycemic states among children whose diets and insulin dosage were regulated to keep their urine sugar-free most of the day. When the same children were given more generous dietary allowances and were permitted to have constant glycosuria, they showed striking improvements in behavior and in disposition. We cannot discount completely the repeated statements of parents, "My child is much better behaved when he (or she) is spilling sugar," and of patients, "I feel better when I am spilling sugar." Some patients take care of this problem simply by not following instructions, though at the cost of family strife and of internal mental turmoil arising from a feeling of guilt.

A most important aid in overcoming such psychological problems will be a maximal simplification of the strictly physiological problems of diabetic control, thus making the nuisance value of the disease minimal. The unrestricted regime has the great virtue of simplification of the rules, and if diabetic care under it can be proved feasible by further experience, the extra freedom is to be devoutly wished by all concerned.

Personally, I was converted to favoring the freer regime partly by a realization that some of the recalcitrant patients who were certainly undisciplined and had not adhered to their recommended diets in the past were getting along fine. Several years ago one of the charming young girls of the clinic whom we regarded as a model patient because she kept a faultless record with neatly distributed zeros and occasional one-plus marks for glycosuria came in one day with her record made out five days ahead of time. Being realistic, I was no less fond of her when she, wide-eyed, apologized sweetly for her error, "Doctor, I'm awfully sorry about that!" Close inquiry disclosed that her reported adherence to the diet prescribed at that time was about as fictitious as the record of urinary tests. Nevertheless, she had had no illness for two years and up to the moment of my disillusionment she would have been cited as a model example of the efficacy of "good control." Subsequently she was put on the unrestricted regime without any change, so far as one could see, and without change in her insulin dosage until she graduated from the Pediatric Service.

SUMMARY

Favorable results have been obtained in the care of diabetic children (all of whom receive insulin) without dietary restrictions or special dietary recommendations other than those deemed desirable for nondiabetic healthy children when insulin has been administered in all cases. Under this regime insulin dosage is adjusted to permit constant mild glycosuria, with precautions against the development of acetonuria. Frequent testing for acetone in the urine *at home* is recommended as an important aid to the regulation of insulin dosage.

The experience to date indicates that the children on this regime show normal growth and development, with minimal ill health, and hospitalization is rare. Hypoglycemic insulin reactions of all degrees are less frequent, and psychologic difficulties and behavior problems at home and at school are notably less among the diabetic children on the unrestricted dietary regime than among those who have been kept on a measured diet with insulin dosage adjusted to keep glycosuria absent or minimal.

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Legislation Concerning Dietitians in the Army

The House of Representatives on March 13 passed H. R. 1943, which provides for the permanent establishment of a Medical Specialist Corps in the Army. The bill will not go to the Senate for consideration. The organization of this Corps provides for a Dietetic Section. Details of the bill were described on page 258 of the March issue of the JOURNAL.

A Practical Approach to Nutrition Education for Children[1]

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NUTRITION education is a relatively new and undeveloped phase of the science of nutrition. It is gratifying to find that nutrition education is assuming a more important role as the knowledge of this science is broadened. For many years, it has been obvious that the lag between the established laboratory findings and their practical application by the majority of the people is far too long. This is due largely to the fact that more time has been spent in developing laboratory techniques than in developing techniques for the interpretation of scientific findings. Both are important. Nutrition facts are valuable only to the extent to which man is able to make them work for his own betterment.

It seems fitting, therefore, in view of the rapid progress being made by the scientist in the nutrition laboratories that more time should be devoted to studying suitable means of interpreting scientific nutrition information. If its usefulness is to be extended to all people, it is imperative that methods of adapting information to the interest and intellectual levels of people of every age be carefully studied. Appropriate techniques need to be developed for use with adults and with children.

The teaching of nutrition to children offers a broad field for study. Changing interests of the growing child, brought about by new learning experiences, demand that the teaching of nutrition be as carefully planned as are other school subjects, if children are to develop better nutritional practices. Nutritionists and educators should not lose sight of the real reason for nutrition education in their eagerness to disseminate information. The aim of nutrition education is a simple one: to establish good food habits which will result in intelligent food selection, day by day, throughout life. To attain this goal, certain fundamental facts must be recognized before an attempt is made to initiate an educational program:

(a) The need for some knowledge of the actual food habits of the children;

(b) An understanding of the accepted theory of learning, which involves an insight into the interest levels of children as well as the manner in which learning takes place;

(c) The length of time required for learning;

(d) The types of experiences which motivate learning;

(e) An appreciation of the joint responsibility to be assumed by the school and the home.

The study of nutrition education of children reported in this paper covers a period of approximately eight years. The work was started in 1936 at Teachers College, Columbia University, under the direction of the late Dr. Mary Swartz Rose. Five years were spent in developing methods of teaching nutrition in the elementary grades to children with intelligence quotients ranging from 60 to 200. During the past three years nutrition education work in the schools has been an integral part of the service of the Nutrition Division of the North Carolina State Board of Health. An explanation of the more recent part of the study will include a discussion of the methods of nutrition education developed at Teachers College as they are applied in a state health program.

Every trained nutritionist working in a health, welfare, or agricultural agency, with a large segment of the population of a state, quickly observes one fact: actions of the majority of the people in producing, preparing, and selecting food is evidence enough that there is a need for a change in the educational approach, if the food habits of the entire population are to show improvement. This does not mean that the food habits of people in general have not improved in the past decade. It merely recognizes the fact that there are still many people who reserve land for money crops rather than for vegetable gardens and pastures; people who continue to prepare food as grandmother did even though its

[1] Presented at the meeting of the American Association for the Advancement of Science, December 28, 1946, in Boston, as part of the American Dietetic Association section on applied nutrition.

nutritive value may be destroyed; and people—well-educated people—who profess to believe that wise food selection is an essential factor in the maintenance of good health for everyone, except themselves. The assortment of ideas, food fads, and superstitions found in urban and rural areas of a state furnish a basis for careful study.

SURVEYS OF FOOD HABITS

Familiarity with the accepted food habits of the people is a requisite for an appropriate educational approach both for school children and for adults. One of the most satisfactory methods of obtaining a picture of the dietary pattern of any particular locality is the dietary survey. In North Carolina it has been the practice for the past three years to make a survey in the community in which the school program is started of the dietary habits of children nine to eleven years of age. This has served two purposes. It has provided a basis for determining the *kind* of information needed to be taught in a particular section and when surveys from different parts of the state are compared, some idea of the sectional food patterns is available.

The surveys, covering a period of three consecutive days, are made by trained nutritionists using the individual interview method. The three days are always selected from the middle of the week to avoid the unusual meals that might occur on Saturday, Sunday, or Monday. Ordinarily the surveys are made in the autumn and in the spring when fresh garden produce may not be plentiful. Since North Carolina is primarily a rural state, information gathered during these seasons provides some indication of the foods used during the months when families must rely on markets and on canned foods.

Nine- to eleven-year-old children were selected because the type of information needed seems to be most accurately submitted by them. It is desirable to know not only what the child has eaten during the day but also the approximate amounts of food eaten. Most children in this age range are able to recall easily the foods eaten over a 24-hr. period and delight in measuring the quantity of food eaten. Below nine years, children have some difficulty in remembering what they ate for supper on the preceding day. Above eleven years of age there is evidence of the well-known tendency of children to seek the approval of adults. Children beyond eleven years of age have acquired enough information about the foods they should eat to influence their reports, although it may not have influenced their food habits.

Tabulation of the foods eaten by the children gives a good indication of the general dietary pattern for the school at large. It is probably safe to assume that the habits of the children reflect the habits of the family. This assumption has been corroborated by surveys made among industrial workers in the same areas.

The results of these food habit studies direct the nutritionist's plan of work and also serve to arouse the interest of the school, home, and community in the nutritional welfare of the children. All the surveys have indicated that the children were receiving adequate amounts of certain types of food but inadequate amounts of other foods which provide some of the nutrients essential for good growth and maintenance of health. The reasons for inadequate diets in North Carolina are many. One of the chief causes, especially in this rural state where food supplies are abundant, is the accepted and established food habits of the people. To modify or change any one of these habits demands careful planning and skillful teaching.

There is still some feeling among school authorities that the home alone is responsible for the food habits of the children, but it is gratifying to observe that in North Carolina more and more schools are readily accepting their share of the responsibility for helping children to develop good food habits. It would have been impossible to conduct as extensive a program in nutrition education if the State Department of Public Instruction and the county and city schools had not cooperated actively with the nutritionists working with the State Board of Health.

IN-SERVICE TRAINING OF TEACHERS

The initiation of nutrition teaching in the schools is impeded because teachers' colleges have not provided their students with a workable knowledge of nutrition. The interest teachers display indicates that more of them would include nutrition as a part of the health instruction if they possessed some knowledge of the subject. One cannot criticize teachers for their hesitancy about teaching a subject in which they have received no training. Therefore, the logical first step in any plan of nutrition education for children is the training of teachers. In North Carolina, the Nutrition Division of the State Board of Health offers in-service training to teachers on a non-credit basis during the school year. The State Department of Public Instruction, moreover, has approved this training as a part of the recommended workshop program.

The eight hours of in-service training is devoted to a discussion of the present knowledge of nutrition and the methods and techniques used in teaching nutrition to children at the various grade levels. Following this, teachers who wish to include nutrition as a part of their regular health program are given individual assistance in planning work for their classes. This aid to teachers consists of: (a) help in selecting the topics to be taught in accordance with the results of the survey and the needs observed by the teacher; (b) provision of lesson guides suitable for the grade; (c) frequent

follow-up visits by the nutritionist after the teaching has been started. This last service has proved to be most valuable. Through continued assistance teachers have gained confidence in presenting this aspect of health. The year after this instruction is started, the nutritionist revisits the teachers whenever she makes her routine visits in the district, and it is anticipated that the nutritionists will serve the schools and teachers as long as they are needed.

The plan of dietary surveys, in-service training of the teachers, and assistance to individual classroom teachers was begun on a demonstration basis in one county. Since that time the work has been extended to both white and Negro schools in a number of counties as requests for the service have been received.

One of the chief reasons for the interest manifested in this particular program of nutrition education is the fact that there has been a graded plan of work suggested for the entire twelve years of school. Frequently, teachers have been urged to teach nutrition without having a guide to help them adapt the information to the grade level being taught. The argument usually offered is that teachers are better able to adapt the information than anyone else, and this would be true if the teacher possessed sufficient knowledge of the science of nutrition. At present, however, the number of primary, elementary, and secondary teachers who are well trained in nutrition is small.

It is equally true that few nutritionists have been trained in the techniques of teaching at the different grade levels. Certainly they should not attempt to grade nutrition material without some experience in teaching children. A combination of nutrition training and experience in teaching children is desirable before attempting to design a curriculum in nutrition. The teaching techniques that were developed at Teachers College in selected schools in New York City with children in all grades of the elementary school provided the basis for practical nutrition work with children in the North Carolina program. The plan of study which evolved is flexible enough to be applied in schools in all sections of the United States.

TWELVE-YEAR NUTRITION CURRICULUM

Before describing the suggested twelve-year program of nutrition education, certain fundamental educational concepts should be reviewed. These concepts are recognized in planning other studies for children and should be considered in planning for nutrition teaching:

(a) Children learn by doing.

(b) Learning takes place through a repetition of experiences and requires time.

(c) Learning takes place most readily when information is adapted to the interest level and the ability of the learner.

(d) Learning is a cumulative process and elementary experiences provide the foundation for a true understanding of more complicated facts.

(e) Tools appropriate to the subject being taught are essential to real learning.

A study of children's interest in food reveals a pattern of development that corresponds closely to their mental and physical growth. This interest provides the key to both the method of teaching and the possible objectives. Using as a guide this procedure of adapting the study of nutrition to the interest and ability of the children, the following plan for nutrition education has evolved.

Primary grades. The aim of nutrition education in the first three grades of the elementary school is to help the children develop favorable attitudes toward the foods they should know and like. The reasons for selecting this objective are evident to all persons who have taught children in these early grades. Food appeals to children primarily because they enjoy its flavor. They either like or dislike certain foods depending upon their experiences with them. To tell a first or second grade child that a food contains specific nutrients essential for growth and health does not influence his opinion of the flavor of the food. His personal experiences cannot have revealed the merits of the known dietary factors nor can enlightening scientific experiences be provided within the realm of his understanding.

Children learn to like foods in only one way, that is, by eating them under favorable conditions. The classroom provides such conditions. Food served in the classroom and eaten by the children and the teacher takes on a party aspect. If it is also prepared in the classroom with the aid of the children themselves, its acceptance is assured. This approach capitalizes on the importance to children of the social approval of their classmates and their teachers and their personal participation in an interesting and satisfying activity. A child can learn to like food as easily as he can learn to count or to read if a favorable learning situation is provided.

When lessons in learning to like one food or one type of food are given once a week during an entire semester, the children have ample opportunity to become thoroughly familiar with what is offered. More frequent lessons covering a shorter period of time are not as effective. The weekly lesson is unique as compared with other school subjects and, therefore, the novelty of it supplies interest. Moreover, this interval of time gives the children opportunity to duplicate classroom activities at home.

Six types of foods which children should know and like can be covered by this method of teaching in three years on the basis of a study of one type of food each semester. For example, dietary surveys might indicate that there is a need for teaching

children to like milk, raw vegetables, fruits, cereals, tomatoes, and cod-liver oil. In some sections of the country, particular foods may need special emphasis, and these could be used as a theme for the lessons. Three years to cover six topics may appear to be slow progress, but the advancement compares favorably with that of other subjects taught in these early grades. An added advantage of this plan is the fact that the introduction of something new each semester is valuable in sustaining interest.

Fourth and fifth grades. By the end of three years of weekly experience with foods in the classroom, the children's attitude is one of willing acceptance of any food the teacher may wish to introduce. Children's nutritional experiences should not now, however, be limited to the enjoyment of the flavor of food. In these grades they may begin to understand the way food affects the body as well. Interest in food is still too general at this age to expect children to grasp the significance of the more technical concepts of the relationships between food and health. Such a study needs to be reserved for a later time. It is sufficient in the lower elementary school to let the children see the way food influences growth.

As in the earlier grades, words cannot be substituted for experiences. Proficiency in verbal knowledge of foods essential for physical and mental development is no assurance of learning, but conclusions drawn from experience provide convincing evidence of the effect of food on growth.

Children may see the effect of food upon growth most easily through experiments with plants and animals in the classroom. Young animals are preferable because they respond quickly to experimental procedures, are easy to handle, and have an especial appeal for the children. In these grades children are interested in pets and wish to take the best possible care of them in order that they may grow well, look well, and be playful. Anything which prevents normal growth and development is cause for grave concern. In addition to the natural emotional interest which the use of animals arouses in children, this experimental approach helps to develop some appreciation of the methods of scientific investigation. The experiments used in these grades are simple. The foods chosen for study being those which need special emphasis as indicated by some knowledge of the food habits of the children.

Only one food or type of food should be studied at a time; otherwise the children will have no way of judging the value of that food. Two young animals, with the usual laboratory specifications, one for a control and one for testing the food under consideration, can be kept in the classroom. If the purpose of the experiment is to compare two foods, for example, whole grain cereal and refined, non-enriched cereal, or milk and a carbonated beverage, one food may be fed one animal and the other food to the second animal. If, however, the purpose of the experiment is to show the value of including a certain type of food in the diet, such as raw vegetables, one animal may have the basal diet supplemented with a raw vegetable while the second animal receives only the basal diet. In animal experiments requiring a basal diet, care should be taken to see that the constituents of the basal diet are foods children could eat, not purified substances.

Weight gains and physical appearance of the animals impress the children with the value of the foods for growth in a manner which can never be duplicated with words or by rules. The children draw their own conclusions regarding the value of the food for growth and apply the information gained to themselves. This direct transfer is probably due to the fact that animals do not seem like experimental tools to children of these ages.

Teachers have no difficulty in conducting animal experiments *if* they start with animals from good stock and if the directions for the experiment are given in sufficient written detail. As soon as the first signs of poor growth are apparent in one animal, children wish to improve the diet of the animal. It is always desirable to restore the animals to health, but care should be taken that no animal is recovered before the signs of poor growth are apparent to each child. The animal's restoration to health will then appear more remarkable, and the reason for the improvement will be better established. Reversal of the diets of the animals likewise is a good procedure, but here again the diets should not be reversed until the effects of the food on each animal are clearly visible to the entire class.

It is obvious, of course, that one animal experiment each semester during the intermediate grades would soon cause the children to tire of this method of teaching. Other types of lessons with growth as the theme need to be used as alternatives.

During the time the experiments are in progress, there is need for continued use of food in the classroom study. Children of these ages still enjoy eating. When the food being fed to the animal is the one being studied and eaten by the children in the classroom, the transfer of the results of the animal experiment to the practices of the children will be made readily. The foods studied during these years may well be some of the same foods the children have learned to eat in the first three grades. This repetition is permissible since the emphasis will be on food for growth rather than food for flavor. It will help also to establish good food practices more firmly.

It should be noted that, as in the primary grades, the emphasis is on food rather than on the nutritive properties of the food. It is especially important at these ages that children's knowledge of nutrition does not become confused with words such as min-

erals and vitamins and other technical terms. Suitable experiences are required to give real meaning to such words. The explanation of these technical terms demands a more complicated type of experiment than most children can understand before they reach the sixth grade. There are exceptions, of course. Gifted children can comprehend more technical studies at an early age, but the number of gifted children in the usual school system precludes the initiation of such studies before the sixth grade.

This postponement of the study of technical information is in accordance with the pattern followed in the teaching of fundamental subjects in the elementary school. No one would think of teaching fourth or fifth grade students higher mathematics or advanced biology. A foundation for the understanding of these subjects must be laid through a study of the simpler phases of those sciences. The same principle applies to nutrition. Proper attitudes and a background of appropriate experiences are indispensable for an appreciation of its more scientific aspects. The introduction of technical words should be delayed until experiences can provide meaning for these words.

Sixth, seventh, and eighth grades. Simplified technical nutrition begins to have more meaning for children after they reach the sixth grade. Although the experiences still must be carefully designed to make them suitable for the age level, interesting experiments are possible. The reasons for the differences in the growth-promoting properties of food should now be explained, and a theme, such as "Why Food Makes A Difference," is appropriate for children in the upper elementary grades.

The best way to teach the nutritive value of foods is to let the children discover for themselves the differences in the chemical composition of foods. They can remove a specific nutrient from a food and test it by feeding it to the animals. Such experiments can be performed in the classroom with a minimum of equipment. The activities provided by this procedure are interesting to the children and have more teaching value than the combined use of text books, posters, explanations, and admonitions. For example, if children have removed calcium from a food, the word "calcium" becomes significant. When they compare the effect of a high-calcium diet and a low-calcium diet on the growth and appearance of animals, the reason for including calcium-rich foods in their own diet is apparent. No formal teaching procedure is an adequate substitute for experiences which allow children to find out for themselves the nutritive properties of foods.

The simplicity of the plan of teaching just described sometimes disturbs teachers until they try it. The majority of teachers expect that nutritional information must be presented in a technical manner. Brief consideration, however, shows that the procedure just described is based on the accepted pattern of learning. Activities within the realm of the children's experiences are used to develop good food habits and to show children why these food habits are important. A sufficient length of time is allowed for the children to learn. Repetition is provided, although to maintain interest it always appears in a new guise. The curriculum is so developed that a new topic is taught each semester. Each preceding year's work serves as a basis for a thorough understanding of the new topics to be studied. In this way a cumulative fund of knowledge is acquired.

One advantage of this graded program is that the children's interest in nutrition is not dulled before they have reached the age when they can understand its more scientific aspects. Memorizing lists of foods that contain certain vitamins and minerals may help a child pass a health examination, but it is no assurance that the knowledge will change his food habits. Familiarity with the terms tends to give a false sense of knowledge. As a result, by the time children should begin to understand the significance of the words, they are weary of hearing them.

High school. The use of the graded curriculum in nutrition in the elementary school will prepare the students for a broader study of nutrition in the high school. A well-coordinated program is not yet possible since few high school students possess a background of nutrition experiences which will help them to understand the broader implications of this science. Consequently, nutrition education procedures recommended for the high school now should include work to supply experiences omitted from their earlier training. These procedures will change somewhat as children enter secondary schools from schools using a graded activity plan of study.

It is not an easy matter either to improve the food habits of high school boys and girls or to interest them in nutrition. By the time children reach the ages of thirteen or fourteen, their food habits are well established. It is easier, however, to influence boys than girls. Most boys possess good appetites at the high school age and are willing to accept almost any food if there is enough of it. Then, too, the natural desire of boys for physical vigor makes them more interested in nutrition than girls who are inclined to adopt different health standards. Girls frequently discard good food practices in an attempt to express themselves as individuals. It requires understanding and considerable skill to influence the food habits of high school girls.

In planning nutrition studies for the high school, therefore, it is necessary to recognize both attitudes toward food. Boys can be approached directly, but for girls an indirect approach is needed. Both boys and girls, however, should learn to consider the importance of nutrition for community health and their responsibility as individuals in helping to maintain high standards of nutrition in their respective com-

munities. Although the present-day high school students may not have had an opportunity to develop a strong background in nutrition, there is much they can profitably learn if the high school program is planned in accordance with the needs and interests of the children and the resources of the community.

Most high schools need to provide some scientific experiments which will show how nutrition influences health. These experiences plus a planned approach to the nutrition problems of the community will give the students an insight into nutrition as a factor in public health. If a good nutrition education program in high schools is to be established, teachers in the various departments must work together in planning their courses of study in order to avoid unnecessary and uninteresting duplication. There are certain subjects such as biology, chemistry, foods, and social studies into which nutrition fits readily, but it can be integrated with all subjects to some extent. When nutrition is integrated with other high school subjects, then nutrition information becomes available to all the students. Too often the study of nutrition is confused with the teaching of food preparation; consequently school authorities see no reason to offer it to boys. All high school children should possess some knowledge of the application of nutrition and its importance for their own health as well as the health of others.

SUMMARY

Research in methods of nutrition education provides sufficient evidence that a true understanding of nutrition cannot be obtained by words alone. Words are not the tools for teaching nutrition. They are merely the tools by which nutrition experiences can be expressed. Experiences are essential to true knowledge. Learning takes place when suitable experiences and appropriate tools are combined. If teaching nutrition is not planned and graded as other school subjects are graded, if nutrition is not related to everyday living, then there is little reason to expect effective results from nutrition education. In like manner, if teachers do not understand nutrition before they try to teach it, few benefits can be derived from the inclusion of this subject in the school health curriculum. No teacher should attempt to teach nutrition unless he is convinced of its importance for his own health and shows evidence of this conviction through his own food habits.

This paper has been limited to methods of nutrition education for children as they are applied in North Carolina. The discussion should not be closed without mentioning briefly the relation of this educational program to the general plan of nutrition education of the Nutrition Division of the State Board of Health. There is little doubt that the educational program followed in the schools will have a more permanent influence on food habits than the educational program used with adults. Nevertheless, adult education is also necessary if the food habits the children develop at school are to receive approval at home. In North Carolina, the community nutrition education program runs concurrently with the school program.

The purpose of the adult education program is two-fold. First, it seeks the support of the adults interested in school children by keeping them informed of the nutrition education program in the schools. Secondly, it tries to extend nutrition education service to adults who have not been reached by any other agencies. This last service is being promoted through the development of a lay-leadership plan of training program.

It is obvious, therefore, that nutrition education for children is only a part of a total community nutrition education program. It is a vitally important part, for the nutritional practices which children develop during childhood will have profound influence on the food habits and the health of future generations.

Low-Sodium and Low-Protein Diets

It has been shown repeatedly that a number of important diseases suffered by man are caused by the inability of the body to adapt to the stresses and strains of living. The list of such "diseases of adaptation" includes: hypertension, coronary thrombosis, nephrosclerosis, brain hemorrhages, ulcers, and painful muscle and joint diseases, usually lumped together under the name of "rheumatism." All of these disorders have been produced in animals, and some work has been done on prevention.

Experiments conducted on rats by Dr. Hans Selye, director, Institute of Experimental Medicine and Surgery, University of Montreal, have shown that such diseases of adaptation may be prevented by diets containing sugar, but little protein and salt. Dr. Selye has succeeded in preventing such diseases as arteriosclerosis, hypertension and nephrosclerosis by such treatment, and hence feels that the usual treatment for such disorders in man—that is the reduction of protein and salt in the diet—has sound basis in scientific sense. He also feels that with additional work done in the laboratory and in the clinic, it may be possible to prolong lives of those who have overtaxed their adaptive mechanisms. If clinical research still to be conducted verifies Dr. Selye's conclusion, men and women over forty will be advised to control the diet so as to ward off possible hypertension, strokes, rheumatic fever, and even allergies.—*From New York* Times, *October 27, 1946.*

Research in Nutrition Education[1]

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THE PURPOSE of this paper is to discuss the studies in nutrition education presently being conducted in Ascension Parish, Louisiana. These studies constitute most of the work done in a research project in nutrition education which was initiated in October, 1944, by the Home Economics Department and the Agricultural Experiment Station at Louisiana State University. The project was tentatively planned for a two-year period and was made possible by a grant from the General Education Board. Beginning in July, 1946, state funds were made available for the continuation of the project for at least another two-year period.

The overall objective of this research project is to determine effective ways of teaching nutrition. It is based on the assumption that the effectiveness of teaching nutrition will manifest itself not only in measurable changes in nutritional status but also in measurable changes of behavior.

In attempting to create situations in which methods of teaching nutrition may be tried and evaluated, certain information is necessary. Without listing all the kinds of information needed, perhaps it is well to mention two kinds which may be collected and studied by teachers with relatively little technical assistance—information about food habits and information about dental conditions. Data on food habits help to establish emphasis points for nutrition instruction in the classroom, in the school lunchroom, and at home. Information about dental conditions helps to arouse interest in child health and creates an awareness of the important relationship of nutrition to dental conditions.

It is generally conceded that one reliable way to collect data about food habits is to make seven-day diet records. Therefore, pupils and teachers were asked to keep records of what they ate for seven consecutive days beginning December 6, 1944.

Special care was taken in explaining to teachers and pupils why and how the records were to be made. No names were put on the records. The children were told that the records were not tests and they were assured that what they put on their records would not affect their "grades." On the record blanks, there were no lists of foods to be checked; the children wrote in the foods eaten. All participants were told that their cooperation would make available certain valuable information which otherwise would be unknown. The record blank used was a modification of one used by Hatcher *et al.* (1) in studying food habits in Dakota County, Minnesota.

Two analyses were made on these data. In one food habits were rated, and in the other the frequency with which each protective food was eaten was considered. No caloric calculations were made for it was assumed that no one in the study would be lacking in the amount of food consumed. However, the records were scored on the basis of protective foods, namely those foods which are rich in protein, minerals, and vitamins.

Food habits were rated *good* when the average daily score was fourteen or more points, *fair* when the average daily score was thirteen to eight points inclusive, and *poor* when the average daily score was seven or less (Fig. 1). Each day's record for each pupil (or teacher) was scored by giving one point for each serving of the following protective foods: eggs, whole grain cereals, meat, raw vegetables, cooked vegetables, fruit, milk, butter and/or margarine.

A count was made to determine the frequency with which certain protective food groups were eaten by children and teachers. The food groups considered were: milk (whole fluid), eggs, fruit (citrus), fruit (non-citrus), meat (lean only), whole grain cereals and bread, butter and/or margarine, potatoes (Irish and/or sweet), green leafy vegetables, and other vegetables (including peas and beans).

[1] Presented at the meeting of the American Association for the Advancement of Science, December 28, 1946, in Boston, as part of the American Dietetic Association section on applied nutrition. The author wishes to point out that the material presented here is merely a report of work under way and that it may be several years before significant results of the work done in Ascension Parish can be expected.

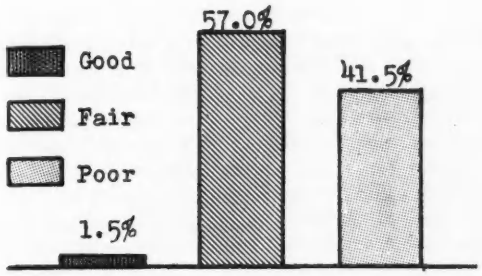
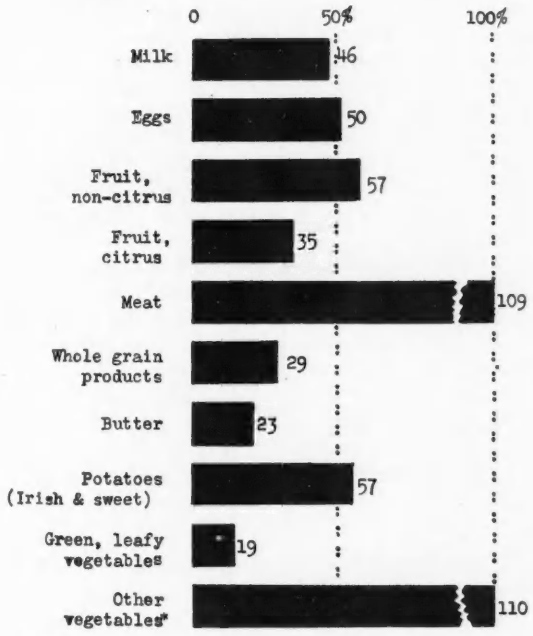


FIG. 1. *Rating of food habits of school children in Ascension Parish, Louisiana, in December, 1944.*

The number of servings of green leafy vegetables *only*, rather than green and yellow vegetables (as often counted together in other studies) was counted, since it was believed that ascorbic acid intake in Ascension Parish was rather low. The count of green leafy vegetables and citrus fruit together could be considered as indicative of the major sources of ascorbic acid. Yellow vegetables were counted and included in the potato group (sweet) or other vegetable group.

Figure 2 indicates the frequency with which each of these groups was eaten in terms of percentage as compared with a standard number of servings. This standard, given in Table 1, was determined after considerable study of the food habit records which yielded information as to availability and customs regarding food in Ascension Parish. It may or may not be appropriate for other sections of Louisiana.



* Peas and beans constituted 62 per cent of the "Other vegetables."

FIG. 2. *Consumption of various foods by school children in Ascension Parish, Louisiana, in December, 1944. Standards are based on Revised Recommended Dietary Allowances of the National Research Council.*

Since one purpose of collecting data on food habits was to determine "needs" so that teachers might know what to emphasize in their instructional programs, the following generalizations seem appropriate:

(a) Teaching units on green leafy vegetables, whole grain cereals, and butter and/or margarine should take precedence over other units of nutrition instruction.

(b) Teaching units on citrus fruits and other sources of ascorbic acid should be second in importance.

(c) Teaching units on milk, eggs, potatoes, non-citrus fruits, meat, and other vegetables should be emphasized in the order listed.

(d) All nutrition teaching units should emphasize the interrelationship of basic food groups to the extent that each group must be represented either by the kind and amounts of food specified or by alternates of the same nutritional value.

Another purpose of collecting information on food habits was to determine "needs" in order to know what should be done to improve them. If children were to be better fed, it was apparent that they should:

(a) Double their consumption of milk, eggs, non-citrus fruits, and potatoes;

(b) Triple their intake of citrus fruits or other sources of ascorbic acid;

(c) Increase their intake of whole grain cereals, butter and/or margarine, and green leafy vegetables by four or five times;

(d) Continue to eat one serving of lean meat and "other vegetable" each day.

TABLE 1

*Standard number of servings of each food group**

FOOD GROUPS	RECOMMENDED SERVINGS PER DAY
Milk	
For children	4
For adults	2
Eggs	4**
Fruit (non-citrus)	1
Fruit (citrus)	1
Meat (lean)	1
Whole grain cereals and bread	2
Butter and/or margarine	2
Potatoes (Irish and/or sweet)	1
Green leafy vegetables	1
Other vegetables	1

* Recommended Dietary Allowances, Revised. Food and Nutrition Board, National Research Council. Reprint and Circ. Series 122, August, 1945.

** Per week.

In conclusion, it was evident that food habits in Ascension Parish were not consistent with those needed to produce well fed individuals, and the survey yielded specific needs upon which to base a sound nutrition education program.

The second survey made in Ascension Parish, Louisiana, as a part of the research project in nutrition education concerned dental conditions. This term has been interpreted to mean more than just dental caries. For instance, it may be assumed that the child who manifests marked decayed teeth and puffy inflamed gums does not have the same nutritional opportunity as the child with good dental conditions—that is, the child with healthy, firm gums and sound teeth. Bad dental conditions may aggravate or cause poor food habits at times. It has been observed many times that children with poor dental conditions—decayed teeth and puffy, bleeding gums—do not eat the food served in the school lunchroom because they cannot chew without pain. Thus their food intake is reduced and the dental conditions can be said to be a contributory factor to their poor nutritional condition.

In determining dental conditions, a dental appraisal was made by the teachers, the nutritionist, and the public health nurse. It was recognized that the group was trained to make only a "screening" inspection; however, there should be little doubt as to the existence of obvious caries in a child's mouth. It was necessary to develop a technique for inspecting dental conditions. A specially designed card was used to guide the teachers and the nurse in making the inspections and served as a cumulative record for each child during his school years. Special effort was made to have both teachers and children understand the limitations of the procedure and that other conditions probably would be reported when a dentist made an examination. Under the conditions of this appraisal, it was found that of the 2240 white children studied in the public schools, 4 per cent had apparently sound teeth, while 96 per cent had apparently carious teeth (Fig. 3). Furthermore, 22 per cent of the children had teeth "decayed but filled," while 78 per cent had "carious teeth not filled" (Fig. 4). A study of tabulations made in regard to six-year molars showed that 22 per cent of the children had one or more six-year molars filled, 46 per cent had one or more which were apparently carious but not filled, 18 per cent had had one or more extracted, and only 27 per cent had one or more sound six-year molars (Fig. 5). It is indeed unfortunate that 18 per cent of the children studied had lost one or more permanent teeth even before they had reached their adult physical growth level.

On the basis of these findings programs of nutrition-health education were developed which provided three specific opportunities for experimental work: (a) interpreting selected nutrition education materials for elementary teachers; (b) testing, teaching, and re-testing high school girls in experimental nutrition classes; and (c) organizing teacher committees to work on problems of nutrition and health.

INTERPRETING SELECTED NUTRITION EDUCATION MATERIALS FOR ELEMENTARY TEACHERS

Considerable money is spent each year in an effort to put nutrition education materials into the hands of classroom teachers. Even the casual observer is impressed by the formidable amount of such materials as pamphlets, posters, films, booklets, and pictures, from both governmental and industrial sources, which eventually reach classroom teachers. While there is little question concerning the amount of material available, the use to which it is put is a more valid criterion of its worth.

It was assumed that if nutrition education materials were used effectively there would be not only increased knowledge of nutrition, but also improved nutritional practices on the part of the individuals

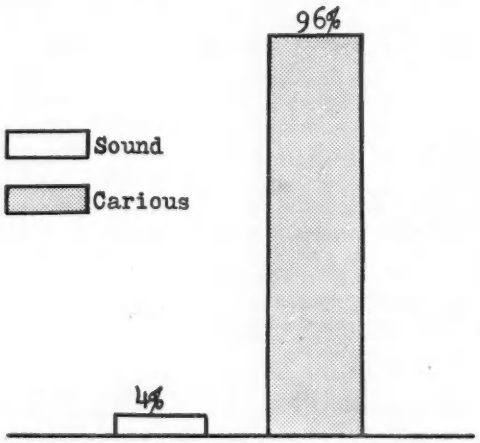


FIG. 3. *Dental conditions of school children in Ascension Parish, Louisiana, in March, 1945.*

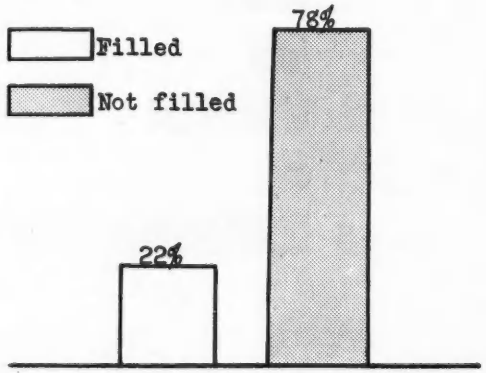


FIG. 4. *Condition of carious teeth of children in Ascension Parish, Louisiana, in March, 1945.*

who used such materials. For the purposes of this study no attempt was made to measure outcomes other than gains in nutritional knowledge and improvements in nutritional practices.

Selected nutrition education materials were sent to all elementary teachers in Ascension Parish. All elementary teachers were given pencil and paper type tests of nutritional information and nutritional practices at the beginning of the experiment in January, 1946. No attempt was made to group the teachers on any basis other than school faculty membership. Since there were five separate schools, each having its own faculty, it was decided that each faculty would be considered as a group; thus there were five participating groups. One group became the experimental group at the invitation of the school principal to the investigator to meet with his teachers and interpret the selected nutrition education materials. Thus interpretations were made to only one group.

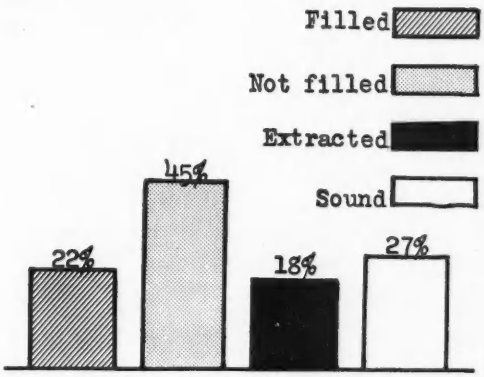


FIG. 5. *Conditions of six-year molars of school children in Ascension Parish, Louisiana, in March, 1945.*

Ten interpretation meetings were held which extended over approximately twelve weeks. Generally, these meetings were informal and followed three steps: (a) the presentation and interpretation of materials related to some specific food group, for example, eggs or milk; (b) the presentation and interpretation of materials related to foods in general, for example, a chart showing "Foods You Need Every Day" from the National Livestock and Meat Board; and (c) group discussion led by the investigator. The same tests of nutritional information and nutritional practices given at the beginning of the study were given again to all teachers at the end of the experimental period.

The results of group scores indicated that teachers made higher scores on nutritional information than on nutritional practice regardless of when the tests were given and regardless of whether they were in the experimental group. Although all groups made

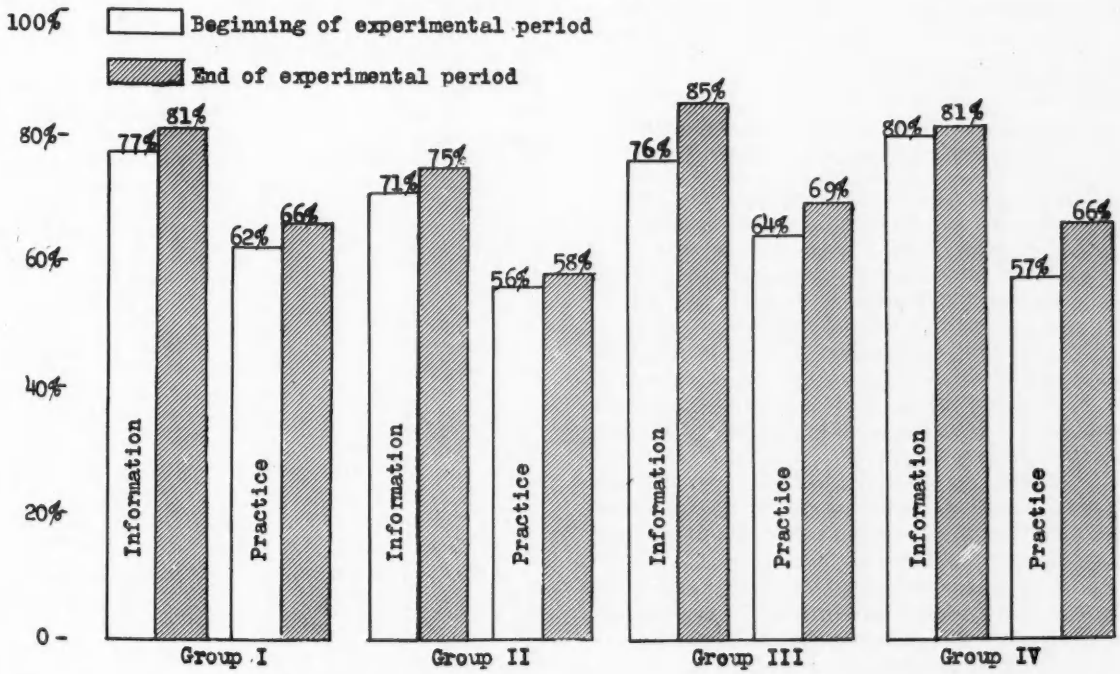


FIG. 6 *Variations in group scores made by teachers on tests of nutritional information and nutritional practice at the beginning and end of the experimental period. Interpretations were made for Group III only.*

some improvements in test scores, the highest scores the second time the tests were given were made by the experimental group for both nutritional information and practices.

The differences between test and re-test scores for both nutritional information and practices were in all cases small (Fig. 6). (Scores for Groups IV and V were treated together and presented as Group IV, in order to get a comparable number of cases in each group.) Therefore, it seems probable that chance rather than control factors may account for the differences. However, the fact that in every case the re-test score is higher than the original score strongly suggests that experiences with selected nutrition education materials was a determinant in the differences. The quality of those experiences, however, cannot be held as significant by the small differences in scores between the groups unless the highest re-test score is considered a valid criterion. If that score is accepted as a criterion, then it may be concluded that nutrition education materials are used more effectively when personally interpreted by a nutritionist.

It may be that an experimental period of longer duration would afford opportunity for a more meaningful approach to this problem. It is recommended that the use of other measuring devices as well as improvement of the ones used in this study be considered and tried under similar conditions so that the effe tiveness of personal interpretations of nutrition education materials might be more critically evaluated. Perhaps it would be well to hold the discussion periods at a time other than the last hour of the school schedule.

TESTING, TEACHING, AND RE-TESTING HIGH SCHOOL GIRLS IN EXPERIMENTAL NUTRITION CLASSES

The purpose of this phase of the study was to determine the effectiveness of teaching nutrition at the high school level. It was assumed that:

(a) When nutrition is taught effectively, not only increased knowledge of nutrition will result, but also improved nutritional practices.

(b) Improved food habits will be manifest in improved nutritional status.

(c) Both nutritional knowledge and nutritional status are measurable, not by a single index but by many indices.

In general, the study emphasized a selected pre-testing, teaching, re-testing procedure concerned with nutritional status, nutrition education, and nutritional opportunity.

Each principal from four of the public high schools in Ascension Parish was asked to invite one teacher, selected on the basis of her qualifications and interest in the field of nutrition education, to participate in this study. The four teachers selected had almost the same college preparation in the field of the biological sciences; however, only two were home economics majors. One had majored in health and physical education, the fourth in zoology. All were graduates of Louisiana State University and had taught in Ascension Parish from one to three years. For purposes of this report the teachers and the groups they taught will be referred to by number. For example, Teacher *1* taught Group I. The teachers, their principals, and supervisors selected the class to be used for the experiment. Then five to seven girls not in the experimental class, but in the same high school grades, were chosen from each school to serve as controls. They constituted Group V and received no formal class instruction, as did the girls in Groups I, II, III and IV. However, all were given all of the tests and were exposed to the same instruction regularly included in the curriculum and in the school lunch program. The classes were made up of girls from only the three upper grades in high school. There were 104 girls studied: 19 in Group I, 12 in Group II, 13 in Group III, 32 in Group IV, and 28 in Group V.

Teachers were asked to set up objectives for a nutrition unit to be taught in approximately twenty-four lessons between the first week in January and the last week in March, 1946. It was recognized that three months is a short period of time in which to expect significant changes to appear in nutritional status under the conditions of this study; however, the usual length of time of a unit of instruction in nutrition or foods and nutrition, at the high school level, is from six to twelve weeks. The guidance given to the experimental teachers by the investigator was highly flexible and general rather than specific. It was felt that this was one means of encouraging maximum creativeness and of bringing to the study a variety of teaching methods. Teachers were told, "Teach it the way you think best. and keep a diary of what you do." Insofar as possible the investigator met with each teacher once a week to observe her teaching and to confer with her on any problem she wished to discuss. A secretarial record of class meetings was made once each week and copies were given to the teacher on request. When the investigator met with the teachers they usually asked her to read the diaries, and sought reassurance that the "class was going along nicely." Much time was spent in planning the details of the testing and re-testing programs.

The teacher's diary and the secretarial records of her class meetings were considered as source data from which to draw descriptions of teaching methods. These data were submitted to the College of Education at Louisiana State University for analysis and summary. Three staff members are studying these data independently and have been requested not only to name the methods used by the experimental teachers but also to describe dominant

variances, if any, in interpretation and application of the methods used.

The testing program employed was concerned with appraising nutritional status, nutrition education, and nutritional opportunity. The individual girls were tested in these three areas at the beginning of the study before any formal classroom instruction was given. The instruction followed immediately. At the end of the instructional period the same tests, with one exception—nutritional opportunity—were given under conditions as much like those of the first administration as possible.

The several groups cooperating in the testing program and the specific indices for which they were responsible were as follows:

(a) The investigator and the four teachers of the experimental classes made appraisals of food habits, dental conditions, height-weight-age relationships, and general appearance.

(b) Members of the staff of the Nutrition Research Division of the Department of Internal Medicine, Tulane University Medical School, made physical examinations with particular attention to any defects which might be attributed to nutritional deficiencies.

(c) Personnel of the Ascension Parish Public Health Unit took blood samples. Laboratory analyses of these samples were then made by the Department of Agricultural Chemistry and Biochemistry, Agricultural Experiment Station, Louisiana State University. Tests included ascorbic acid determinations by the Mindlin and Butler macro-method and plasma protein and hemoglobin by specific gravity according to the methods of Phillips, Van Slyke, *et al.*

(d) The Department of Health and Physical Education, Louisiana State University, made appraisals of general motor ability, including tests of general body coordination, arm and shoulder strength, abdominal strength, agility, and endurance.

(e) The investigator developed paper and pencil tests to measure attitudes, interests, information, and practices regarding nutrition, from which appraisals of nutrition education of each girl were made.

(f) In cooperation with one of the experimental teachers, another pencil and paper device which sought specific information regarding the availability of protective foods at home, at school, and in the community was developed to determine nutritional opportunity. Due to limited time, this appraisal was made only once. However, it served as one means of uncovering some of the facts needed to guide some of the girls in their nutritional problems.

Data collected are being studied independently by the several groups responsible for specific phases of the study. It is planned that an interchange of findings and interpretations shall be made as soon as the separate groups are ready. For example, the blood data were made available to the physicians several months ago, and several conferences have been held by the investigator with individuals cooperating in the study.

Although only four teachers' methods are considered in this experiment and the effectiveness of their methods was measured in terms of group increments, it is believed that a careful study of the most productive methods should yield several procedures which might be tested under more carefully controlled conditions. Therefore, the work reported here should be held as preliminary. At least, it represents an attempt to evaluate certain techniques to a given situation. The extent to which most public schools will lend themselves to experimentation puts rather definite limitations on research studies. There are many factors which constitute unmanageable variables in any classroom, yet it is possible to approximate experimental research procedures in teaching-learning situations when teachers develop experimental attitudes toward their jobs and when valid techniques are used in appraising the outcomes of their efforts. Neither of those two conditions was realized to even a mildly satisfactory degree in this study, but it is believed that they did approximate a beginning step in a desired direction and may be used as the basis for continued study.

ORGANIZING TEACHER COMMITTEES TO WORK ON PROBLEMS OF NUTRITION AND HEALTH

When the surveys of food habits and dental conditions of children had been made, it was evident that a next step might be that of developing ways to acquaint teachers, pupils, parents, and others concerned with the results. Since it was impractical to work directly with all teachers, it was decided to work with a committee of teachers from each school. Primary, upper elementary, and high school grades were all represented.

An account of how this committee's work was planned as an integral part of the Third Ascension Parish School Work Conference has been published elsewhere (2). While that report concerns the organization of a two-week study program of *the representative committee way of teaching nutrition*, it is the purpose of the following section of this paper to summarize some of the activities carried on by members of that committee in their respective school-community situations during the past year. It is planned that the committee shall continue working for several years and that annual summaries of the work will be studied.

Although *the representative committee way of teaching nutrition* is not a highly scientific approach to nutrition education, it is believed to be practical for it affords one means of stimulating interest and disclosing information pertinent to nutritional

problems in a given situation. It may depend upon informal yet specific means of evaluating its effectiveness. For example, it is assumed that a parish-wide food habits survey made each December will reflect and appraise the work of the teacher committee.

The representative committee has an elected chairman and secretary in charge of parish-wide committee meetings as well as an elected chairman and secretary in charge of meetings held by each of the five separate school committees. The committee is responsible to the principal who is an "ex-officio" member of the committee. A home economics teacher and an agriculture teacher are members of the committee by virtue of their training and interests. Other members are named by voluntary expression of interest or by election by the faculty to serve for two consecutive school years. Records of meetings and activities are kept by the secretaries, and reports are made in terms of objectives, activities, and evidences of success. Copies of reports are made available to the investigator.

A study of committee work as revealed by the secretarial reports and supplemented by frequent visits to schools shows that at least five different kinds of nutrition education activities were promoted by the committees in 1945–46. They were:

(a) Instructional activities with pupils in classrooms and lunchrooms (all schools);

(b) Periodic meetings with school lunch personnel to "score" lunches served in terms of protective foods (three schools);

(c) A community-leader meeting to discuss food habits and dental conditions as revealed by surveys and to plan for a community meeting to discuss food habits, dental conditions, and plans for improvement (one school);

(d) A meeting as planned in (c) above with teachers and community leaders participating on the program and in the discussion (one school);

(e) A meeting with parents at school. Teachers were responsible for the program. Little discussion followed (one school).

A study of the food habits revealed in the December, 1945, survey, made under conditions as much like those of the 1944 survey as possible, showed that considerable improvement had been made in eating habits of Ascension Parish school children (Fig. 7 and 8). However, the survey findings showed that improvement in food habits did not occur in all of the five schools participating. In fact, total improvement was made in only two schools; nevertheless, this improvement was so marked that retrogression in the other three schools was offset by a margin large enough to show an overall improvement of food habits on a parish-wide basis.

It appears that the improvement in food habits in two of five schools did not occur by chance. Only in these schools were community-leader and community meetings held. Furthermore, it is interesting to note that the school making the greatest improvement was the one which promoted the community-leader meeting and then the community meeting. The other school showing improvement did not have a community-leader meeting, but rather a community meeting which was planned and executed by the teachers.

While a certain amount of speculation is permis-

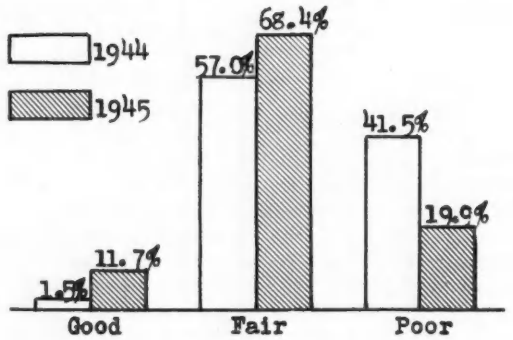


FIG. 7. *Rating of food habits of children in Ascension Parish, Louisiana, in December, 1945, as compared to December, 1944.*

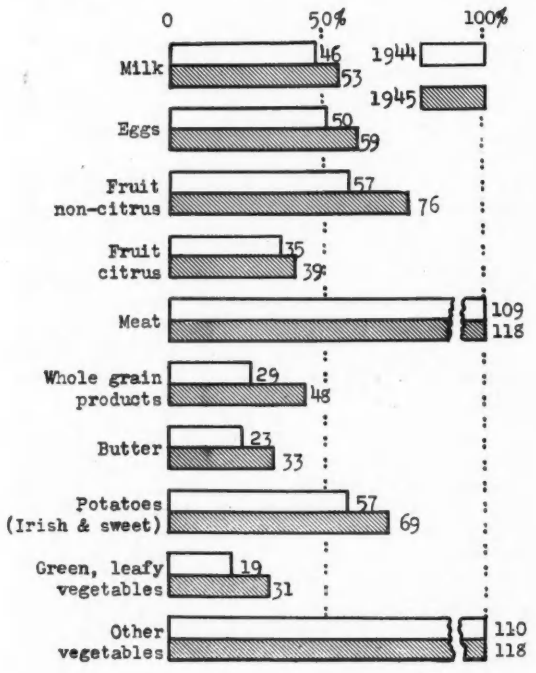


FIG. 8. *Consumption of various foods by school children in Ascension Parish, Louisiana, in December, 1945, as compared to December, 1944. Standards are based on Revised Recommended Dietary Allowances of the National Research Council.*

sible, it should not be concluded that the conducting of food habits surveys, followed by a community-leader meeting and then community meetings will yield improved food habits. Indeed, there are many factors involved. However, it does seem that teacher committees work more effectively to improve food habits through education in a given situation when they enlist the interest of community leaders and others directly concerned (by inviting them) to "study the facts" and plan together for possible solution to nutritional problems than they do without participation of community leaders.

SUMMARY

Surveys were made to determine food habits and dental conditions of school children of Ascension Parish, Louisiana. Findings showed "needs" and yielded facts upon which to build a sound nutrition and health education program. Selected nutrition education materials were sent to five groups of teachers in that parish. The investigator interpreted those materials to only one of those faculty groups in a series of meetings. Tests of nutritional information and practices were given to all five teacher groups to determine effects of the interpretations.

Teacher committees were organized in each school to work with pupils, teachers, school lunch personnel, and parents in improving food habits and dental conditions as well as in other phases of their nutrition-health program. Experimental classes in high schools were conducted by teachers. Diaries kept by these teachers, as well as secretarial records of class meetings, are being studied to determine methods used. The effectiveness of those methods were considered in terms of group gains as shown on a battery of tests, including food habits; height-weight-age relationships; general appearance; dental conditions; physicians' examinations; blood levels of protein, hemoglobin, and plasma ascorbic acid; general motor ability; body coordination; arm and shoulder strength; abdominal strength; agility and endurance; nutritional information; interests; attitudes and practices; and nutritional opportunity.

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Expansion of Nutrition Service in the Children's Bureau

Three nutritionists have been added to the staff of the U. S. Children's Bureau as regional consultants in the health services division. They are: Catherine M. Leamy, whose headquarters will be New York City; Alice H. Smith, who will be located in San Francisco; and Ansta Todd Barr, whose office will be in Dallas. They will work under the direction of Marjorie Heseltine, director of the Bureau's nutrition unit. Appointment of these consultants is in line with the general expansion of maternal and child-health services now taking place throughout the country as the result of Congressional action last summer that doubled the appropriation available for this work under the Social Security Act. Programs are administered by the state health departments in accordance with plans worked out by the Children's Bureau regional offices. These offices are staffed by physicians, medical social workers, and nursing personnel, and nutritionists.

Miss Leamy, consultant for the northeastern region, comes to the Bureau from the American Red Cross. She has also had experience in both the Massachusetts and Maryland state health departments.

Mrs. Smith, who will serve the West Coast states, was superintendent of nutrition of the Bureau of Maternal and Child Health of the Michigan State Department of Health and had previously been with the Cleveland Health Council. She is secretary of the food and nutrition section of the American Public Health Association and also secretary of the nutrition unit of the American Association of Health, Physical Education and Recreation.

Mrs. Barr, who will serve as consultant for the Dallas and Denver regions, was nutrition consultant for the Arizona State Department of Health, and had previously been nutritionist for the Elizabeth McCormick Memorial Fund of Chicago for five years.

Miss Heseltine, in addition to directing the Children's Bureau unit, serves as regional consultant for the District of Columbia, Virginia, West Virginia, North Carolina, and Maryland. The assistant director, Helen Stacey, is regional consultant for the southeastern states, with Atlanta as the center. Eleanor Wilkinson McCarl will continue as consultant for the Chicago-Kansas City region, with headquarters in Chicago.

Recent Trends in Frozen Foods[1]

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THE FROZEN food industry is not a new industry. By the beginning of the twentieth century fish, meat, and eggs were being frozen by industrial processes. As early as 1905 fruits were preserved by freezing, but not until 1929 when vegetables were successfully frozen did this part of the food industry sense its tremendous opportunities. For this reason, the industry has all the earmarks of a new industry and it is now growing like an adolescent. It has not reached the age of stability, caution, and conservatism. It is bold, unpredictable, confusing, but very promising.

The rate of growth of the frozen food industry is unique, as shown by the fact that the industry has grown from a pack of 50 million lb. in 1905 to 789 million lb. in 1945, of which 738 million lb. were fruits and vegetables. It is estimated that by 1955 there will be 3 billion lb. of food frozen annually. The industry is preparing itself for this rise. A modern plant in Florida is equipped to freeze 400,000 lb. of citrus fruit and fruit products per day—twelve carloads. There are today approximately 450 commercial freezing companies, and this number will be greatly increased in the next few years.

Every survey has shown a general acceptance of frozen foods by the public. A large part of the expected expansion and improvements of hotels and other institutions will be in refrigeration facilities. In a recent survey of hotel chefs and managers, over 95 per cent liked frozen foods. Eight out of every ten housewives living in cities of 100,000 or more buy frozen foods, and in one department store of a large city 25,000 frozen pies were sold in three months.

There is room for expansion. The estimated per capita consumption of frozen fruits and vegetables is only a small percentage of the total consumed, as seen in Table 1. Whether the frozen food industry will realize its anticipated growth depends upon many factors, of which quality of the product and better understanding on the part of the public of its care and use seem to be of greatest importance. A nationwide survey of acceptance and use of frozen foods by hotels showed a great need for better directions for the best methods for use: how to store and to thaw, time necessary to thaw, how to cook, and number of servings. The industry as a whole is well aware of this need as well as the need for quality control. Repeated articles appear in the trade journals on the importance of maintaining and improving quality in frozen food. An outstanding authority on frozen foods, Dr. D. K. Tressler, has said of frozen foods (1), "I predict that those which are found to be inferior to high-grade canned foods will soon disappear from the market," and E. T. Gibson, vice-president of General Foods, has warned (2), "This $100 million a year industry is jeopardized today by the fellow who puts on the market quick-frozen food which the housewife discovers is not a quality item."

TABLE 1

Estimated per capita consumption of fruits and vegetables in the United States

FORM	FRUIT	VEGETABLES*
	%	%
Fresh	84	84
Canned	12	13
Dried	3	2.5
Frozen	1	.5

* Except potatoes.

Great strides in improving quality have already been made, some by mere chance and others after carefully planned research. A recent survey compiled by McIntosh (3) shows that investigations of interest to the frozen food industry are being conducted at forty-two universities or colleges, fifty commercial companies, eleven government departments, and four foundations. The projects cover an enormous field. Much of the present confusion and errors will continue to exist until the research of these laboratories is more nearly

[1] Presented at the 29th Annual Meeting of the American Dietetic Association, October 18, 1946, in Cincinnati.

completed. For decades agriculturists have been experimenting to improve varieties of fruits and vegetables from the standpoint of productivity and ability to withstand storage and shipment. These characteristics are of little importance to frozen foods as most fruits and vegetables are ready for freezing within an hour after harvesting. Research projects in hybridization at experiment stations, many supported by commercial freezing companies, are underway to develop varieties of fruits and vegetables best suited to freezing. Many of the more popularly grown varieties are not adaptable to freezing.

It is well known that maturity of product affects its ability to withstand freezing and thawing, as well as its holding qualities on a steam table. Many producers are cognizant of these facts, but the shortage of labor, especially at time of harvest, has been a handicap during the past few years.

The need of blanching of vegetables to prevent enzymatic oxidation during freezer storage has long been recognized. The technique of determining oxidative enzymes quantitatively is being improved. Research is still under way in many institutions to determine the best temperature and method, as well as the length of time, of blanching and cooling. In these studies not only is the palatability of the product considered but also the loss of nutrients. Work at Syracuse University has shown that the best length of time to blanch varies greatly with the kind of vegetable, some being much more sensitive to variations than others (4). While specific techniques of handling food before freezing are now available, it is expected that there will be some changes as a result of the many studies now under way.

The darkening of some frozen fruits, notably peaches, on thawing can now be overcome by the use of anti-oxidants. Of these, ascorbic acid is the one more frequently used (5). Probably most of this year's pack of frozen peaches will be so treated, but the success for this treatment may not be perfect because the proper amount of ascorbic acid for all varieties of peaches is not known. In addition, the effect of maturity or other qualities may alter the amount of anti-oxidant needed. It has been found that ascorbic acid with citric acid is more effective than ascorbic acid alone. No doubt other anti-oxidants will be found. Ethyl caffeate has been mentioned.

Ever since the introduction of the quick method of freezing by Clarence Birdseye, there have been many polemics on the importance of the rate of freezing and the resulting quality. At the present time the rates of freezing vary from 30 min. or less (quick-freeze) to 4½ or 5½ hr. Quick-freezing is accomplished only when the food comes in direct contact with the refrigerant, weak brine, or sugar sirup. When food is frozen less quickly it is placed in cold storage, temperatures varying in practice from 4° to −40° F. This method of freezing is used in home and farm freezers and in most locker and many commercial plants. The controversy has by no means been settled. There are many factors involved other than effect on quality of pack, such as efficiency and cost of operation. When frozen food is entirely consumed within a comparatively few months after freezing, any of the present practices gives a satisfactory product, provided the food frozen has been carefully selected and prepared for freezing. The final judgment must wait until the time when foods are held over a period of a year in freezer storage. It is now generally agreed that 0° F. is low enough for normal periods of storage. Of greater importance than lower storage temperatures is the proper selection and treatment of the food before freezing.

Investigations of the bacteriological aspects of frozen foods have shown that freezing and holding in cold storage (0° F.) inactivate bacteria but do not sterilize (6). Freezing followed by storage at 0° F. for a month destroys trichinae. After thawing, foods are subject to the same spoilage and the development of toxin as any other similar foods. Growth of microorganisms is not significant in raw or blanched foods which have been held for 24 hr. at 70° F. At 40° F., the same food can be held two days before significant growth takes place. Many housewives have been misled into thinking that frozen fruits and vegetables which have partially thawed, as in transit, must be used immediately and not refrozen. From bacteriological tests made so far, these fears seem to be ungrounded. However, any food which has partially thawed and is refrozen will be a poorer product, for thawing and refreezing increase the cellular destruction. This results in a poorer texture and often poorer color and flavor. Frozen precooked foods present another problem because many cooked foods make such excellent media for bacteriological growth. Tests have shown that frozen precooked foods can be carriers of microbes which are not necessarily destroyed in the normal reheating period. The importance of sanitary procedures prior to freezing is, therefore, paramount. The great variety of frozen foods appearing on the market within the past three years has brought warnings from many bacteriologists of the great danger of food poisoning. Thorough reheating of these frozen precooked foods, either in the frozen state or immediately upon thawing, is indubitably the only safe procedure at the present time.

Thawing is a vexing problem for the consumer. For vegetables, thawing before cooking is unnecessary except for such vegetables as spinach, broccoli, and asparagus which either do not quickly break apart in boiling water or have tender tips which are easily overcooked. It is recommended that such

vegetables be thawed, partially thawed, or cut into smaller portions. With meats, reports are conflicting. Some authorites claim that meat is drier if thawed before cooking. Last June experiments conducted in the laboratories of Swift and Company showed that there was little or no difference in cooked meat of all kinds and cuts, whether the meat was cooked without thawing or previously thawed in the refrigerator or at room temperature. Tressler has recommended thawing of large cuts. At the moment, the thawing of frozen meat before cooking is done primarily as a matter of expediency. Often the time available for cooking determines whether it is advisable to thaw before cooking. Unthawed roasts take about 10 min. more per pound in the oven and 6 min. more per pound in the pressure sauce pan. Tests at Syracuse University have shown that unthawed small pieces of meat, such as frozen cut fowl, do not require additional time to cook in a pressure sauce pan, since these cuts are usually browned before steaming (7, 8).

The use of electronics as a means of quickly thawing institutional packs and large roasts has been publicized in the newspapers. Realists, however, are inclined to believe that the cost of electronic heating devices will prohibit their use for many years. The first appliance of this kind will probably be designed to thaw and cook in one operation and will find application in railway diners and airplanes rather than hotels and restaurants.

It is generally agreed that while freezing causes various structural and colloidal changes in foods, there is no change in nutritive value due to the freezing itself. In the case of vegetables, there is a loss of 5 to 14 per cent of vitamins due to the blanching and chilling prior to freezing. The longer the food is blanched the greater is the loss of all soluble nutrients and heat labile vitamins. It should also be pointed out that unless the oxidative enzymes are destroyed by blanching, a severe loss of those vitamins subject to oxidation takes place in storage. That there is some loss of vitamins during storage is well recognized (9–12). More recently it has been shown that this loss may be correlated with the effectiveness of blanching because frozen foods of highest quality have been shown to have the least enzyme content. It has been noted by many investigators that the highest palatability scores are generally found in food which has the highest ascorbic acid content. The destruction of vitamins appears to be concomitant with changes in flavor and color and often texture. As to cooking, all investigations have shown that the vitamin content of carefully frozen vegetables after proper cooking compares favorably with cooked fresh vegetables.

Frozen precooked foods have held the spotlight in the past three of four years. The first real volume pack came in 1942 when scarcity often led processors to package food in paper cartons and freeze. Much has been learned during this time, mostly by the trial and error method. No one wants to predict the future of this part of the industry. Many feel that its success in the past three years has been due to scarcity of many foods in the retail market. Everyone is agreed that no frozen precooked food has been subjected to the acid test, as most of it has been sold within a few weeks or months after freezing. To cite one example of the importance of time in storage, two years ago, at Syracuse University, tests were made to discover the effect of storing in the frozen state large numbers of sandwiches of the type found in school lunchrooms. It was felt that if these could be successfully frozen, it might solve a lunchroom problem. Egg salad, bologna, peanut butter, jelly, and tuna fish salad sandwiches were used. The sandwiches were sealed in Cellophane bags, and tested at the end of a week and after four months. At the end of a week the jelly had been absorbed by the bread where insufficient spread had been used. Otherwise all sandwiches were quite satisfactory. After four months it was a different story. The tuna fish salad sandwich was the only acceptable product.

The fact that a food freezes well in the raw state is no indication that it will freeze well after cooking. Contrary to expectations, many frozen cooked foods do not withstand storage as well as the same food uncooked. Flavorings or seasonings may be augmented or diminished by freezing. The flavors of pepper and celery become stronger while onion and salt diminish. Salt added to meat such as pork sausage decreases the storage life. Sage has the opposite effect. Gravies, mayonnaise, and other colloids break. Gravies can be reconstituted by beating, but not mayonnaise. It is expected that some of the colloidal changes can be controlled by use of proper stabilizers or by adjusting *p*H value. Fully cooked potatoes fall apart and cooked egg whites get tough and rubbery. Nevertheless, there are many items which have been frozen quite successfully and many more can be expected. Frozen pies of high quality are now in production. Fresh apple pies made from the best pie-making apples may be obtained at any time in the year. The storage life of pastry is still a moot question, but the use of any of the fat anti-oxidants ought to eliminate that problem. The problem of frozen cake batters is one of stability of the batter and quality of ingredients. Only strictly fresh eggs and the best quality of ingredients can be used. Our experience is that a frozen cake batter produces a better product than a frozen baked cake. There is a small loss in volume during storage of cake batter, but this is more than compensated for by the freshness of the final baked cake. Frozen cake batters are best baked without thawing and take just a few minutes longer to bake than a freshly-made

batter. On the other hand, a frozen baked cake takes several hours to thaw and will have a sticky crust.

Packaging is a major problem for the frozen food industry and particularly for frozen precooked foods. It is expected that metallic containers or containers with metal linings will simplify this problem to some extent. For frozen precooked foods and many others, it would be desirable to have a container in which the frozen food can be reheated. Such containers are already in the experimental stage. Singer of Sun Valley has been experimenting with the packaging of individual servings of frozen precooked food (13). The food wrapped in a parchment bundle is reheated in its container in or over boiling water for serving.

If and when the frozen food industry gets into full swing, there are bound to be certain effects, some of which are already being felt. The advantages which early producing farm areas have had will be diminished. During the period of greatest production of a given perishable product, such as strawberries, the demand by the freezer plants will decrease the supply, resulting in a higher level of prices for the farmer. The freezing of all foods will have the same leveling effect on prices as the cold storage warehouse has had on egg prices. All areas of the United States will have greater opportunity to enjoy the fruits of the land, now shared to a greater extent by the producing areas. For the hospital dietitians or the food service managers who buy the food and plan the meals, freezing lockers full of weeks' or months' supply of food will make it easier to carry out planned meals and planned budgets.

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Frozen Foods Now Flown Without Refrigeration

A new packaging material, called a "frozen food blanket," has been developed which makes possible the transportation of frozen fruits and vegetables by air without in-transit refrigeration. The "frozen food blanket" maintains the temperature within 2°F. of the frozen products for a period of 72 hr. It is comprised of two sheets of impregnated heavy wrapping paper with ½-in. sheet of rock-wool, and is placed crosswise in a regulation corrugated cardboard carton, then folded over, and stapled before the carton is sealed. Thus the container is virtually air tight, preventing the cold air from escaping and keeping the warm air from reaching the interior of the box. Experiments in the use of the "frozen food blanket" have been carried on by TACA Airways in shipping food to Latin American countries.

Heretofore, losses occurring during water transportation of fresh fruits and vegetables have run as high as 50 per cent, due to the length of time the products were en route, but the cost of air transportation virtually prevented any widespread export of foods from this country. The "frozen food blanket" eliminates the necessity of using space for ice containers, thus saving both express charges and excessive weight. It is felt, for this reason, that with this new method of packing for shipment, such foods as apples, grapes, lettuce, and celery, which have never been included in the diets of Central and South America, can now be made available to the peoples in those regions.

Palatability and Vitamin Retention in Large-Scale Food Preparation of Dehydrated Sulphited Potato Strips[1]

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THE PURPOSE of this study was to determine the palatability and the ascorbic acid and niacin retention in dehydrated sulphited potato strips during four methods of large-scale preparation and three methods of holding the cooked potatoes warm for serving. Two of the methods of preparation were those outlined by the Army Quartermaster Corps. Two of the holding methods were similar to those used in the Army. A further purpose was to determine the effect on vitamin retention and on palatability of cooking the dehydrated potato strips after they had been stored at room temperature for four months in unopened tin containers. Potatoes were also prepared in small quantity to determine whether flavor could be improved by various cooking procedures. The objective was to determine the best large-scale method of preparation from the viewpoint of palatability, nutritive value, and management.

HISTORY OF THE POTATOES

The sulphited dehydrated potato strips, which were released by the Army Quartermaster Corps, were from the J. R. Simplot Dehydrating Company, Caldwell, Idaho. They were processed in September, 1944, from Idaho potatoes produced in the western section of Idaho.

Prior to dehydration, the potatoes were thoroughly washed and steam-cooked to a depth of approximately $\frac{3}{16}$ in., after which they were peeled in a 14 per cent lye solution. After thorough washing, the potatoes were trimmed and cut into strips. They were again washed, and then blanched at 207° F. for 3 min. 10 seconds. They were dried for approximately 14 hr. in counter-flow tunnels heated with fuel oil containing sulphur. The sulphiting was accomplished by the use of the products of combustion.

The potatoes, packed in 5-gal. tins each containing 16 lb., were received in this laboratory early in 1945. Those used in the main part of the study were stored at 32 to 35° F.; those used in the storage study were stored at room temperature. The remaining contents of opened tins were stored in the original tins at 0° F., and were used within two weeks. Cooking studies were made from March through October, 1945.

EXPERIMENTAL METHODS

Cooking methods:

The potato shreds were cooked in amounts to serve 100. When samples were to be taken at intervals during preparation, larger proportional amounts of potatoes and water were used at the start so that their weights at the time other ingredients were added corresponded to the amounts in the recipe for 100 servings. Each cooking method was repeated either four or five times.

Method *1:* The potatoes were prepared as boiled potatoes following the directions given by the processor and using the Army field range. The potatoes, 3175 gm., were added to 13,610 gm. of water at 68° F. in the large covered stock-pot of the field range. The water was brought to a boil within 38 to 46 min.; 255 gm. of table salt were then added; and the potatoes were simmered for 14 min.

Method *2:* The potatoes were prepared as "scalloped" potatoes following the standard Quartermaster Corps' directions for *au gratin* potatoes with the omission of pepper, cheese, and breadcrumbs, and the substitution of hydrogenated fat for butter.

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The potatoes, 3751 gm., were soaked in 17,237 gm. of water at 68° F. for 30 min. One twentieth by weight of both the soaked potatoes and the soaking water were used for sampling, and the remainder was brought to a boil in the stock-pot in the Army field range (45 to 91 min.) and simmered for 10 min. Again one twentieth by weight of the drained, cooked potatoes and the cooking water were reserved for sampling. The rest were placed in the covered roasting pan and mixed with 1642 gm. evaporated milk, 1814 gm. cooking water (when drained water was insufficient, tap water was added), 168 gm. table salt, and 454 gm. hydrogenated fat. These potatoes were baked in the field range for 30 min.

Method *3:* The potatoes were prepared as mashed potatoes according to the standard Quartermaster Corps' directions. The potatoes, 3500 gm., were soaked for 20 min. in 17,025 gm. of water at 68° F. in the heavy aluminum, field range stock-pot. Nineteen twentieths of the soaked potatoes and of the soaking water were brought to a boil (38 to 40 min.) on top of an institution-type gas range. They were then simmered uncovered, for 10 min. Proportional amounts were removed for analysis. The drained, cooked potatoes were then beaten with a wire whip in the aluminum bowl of a mechanical mixer at low speed for ¾ min. and then at high speed for ½ min. A mixture of equal parts of hot evaporated milk and drained cooking water (1361 gm.), plus 113 gm. of salt was added. The potatoes were beaten at low speed for 1 min., and then at high speed for 3 min. They were scraped from the sides of the bowl at each change of speed. The overall time was 10 min.

Method *4:* Potatoes which had been stored in the unopened tin containers at room temperature for four months were prepared as boiled potatoes by Method *1*.

Method *5:* The potatoes were "scalloped" by adding 3402 gm. potatoes to 15,000 gm. water, 454 gm. hydrogenated fat, 1642 gm. evaporated milk, and 168 gm. table salt in the covered roasting pan of the Army field range. The water was brought to a boil (46 to 62 min.). Then the pan was uncovered and the contents were simmered for 47 min.

Holding methods:

The potatoes prepared by Methods *1* and *4* were drained and held covered in the large roasting pan in the top of the Army field range with the flame turned low, for 30 and for 90 min. The temperature of the held potatoes ranged from 199° to 219° F.

The "scalloped" potatoes prepared by Method *2* were held in the covered roasting pan in the Army range with the heating unit turned off. At the end of the 30-min. holding, the temperature of the potatoes was about 158° F.

Two 4000-gm. portions of the mashed potatoes prepared by Method *3* were held for 30 and for 90 min. in aluminum bootlegs[2] placed in an institution-type warmer set at 140° F.

Sampling:

All samples for vitamin and total solids analyses were taken in duplicate.

Samples of the dehydrated potatoes were analyzed before each cooking study. Losses during cooking were then calculated from these results in order to rule out any changes during storage and variations from tin to tin.

To obtain better extraction, about 200-gm. aliquots of the dehydrated potatoes were ground to 40 mesh in a Wiley mill and were well mixed before samples were taken. The samples for ascorbic acid were soaked in 2 per cent metaphosphoric acid overnight in the refrigerator before being ground in the Waring Blendor.

After soaking and after cooking, the potatoes were drained in an aluminum colander for from 3 to 5 min. Composite samples (about 400 gm.) of each of these, as well as of the mashed and scalloped potatoes (which were taken from representative portions of the container), and of the milk were well mixed. Samples for analyses were weighed from these composite samples. Those for the determination of ascorbic acid were immediately immersed in the acid extractant.

Palatability tests:

Potatoes prepared by each method were scored for flavor, texture, and appearance by at least six experienced judges. The held potatoes were also scored. Five points were allowed for each factor so that the highest score possible was fifteen.

Potatoes were prepared in small quantity to determine if the objectionable sulphite flavor could be removed, if the potatoes could be successfully baked without preliminary cooking, and if the use of fresh milk instead of evaporated milk improved the flavor. The potatoes were prepared as follows:

1. Soaked 20 min., and then simmered until tender (about 15 min.).
   a. Mashed with the addition of evaporated milk and drained cooking water.
   b. Mashed with the addition of evaporated milk and tap water.
   c. Mashed with the addition of fresh milk.
   d. Baked (evaporated milk added) at 375° F. for 30 min.
2. Soaked 20 min., drained, cooked in fresh water until tender, mashed with the addition of fresh milk.

[2] A bootleg is a pan without handles, resembling in shape the upper part of a double boiler. The upper diameter was 8½ in.; the pan was 11 in. deep, and held 2 gal.

3. Baked at 375° F. (tap water and hydrogenated fat added) for 45 min.

Methods of analysis:

Ascorbic acid was determined routinely by the Bessey and King (1) titration method using 3 per cent metaphosphoric acid as the extractant and with the use of hydrogen peroxide to prevent action of the sulphite with the dye.

Ascorbic acid was also determined in a few parallel samples, taken from the last three replications in cooking Method *1*, by an indophenol-xylene reduction method. This method was one outlined by Nelson and Somers (2) and was based on Pepkowitz' modification of Stotz' method. Again hydrogen peroxide was used. The dehydrated potatoes contained an average of 86 mg.; the cooked potatoes, 62 mg.; the potatoes held for 30 min., 62 mg.; and the potatoes held for 90 min., 57 mg. per 100 gm. on the dry basis. These values agreed fairly well with those found by the Bessey and King method except for the held potatoes in which the values were higher.

A comparison was made of the protective action of 2, 3, 4, and 5 per cent metaphosphoric acid on the stability of ascorbic acid in potato samples stored overnight in the refrigerator. Apparently even 2 per cent metaphosphoric acid was sufficient to retain the ascorbic acid in the sample during overnight refrigeration (Table 1). The stability of the ascorbic acid in these potatoes was no doubt greatly affected by the inactivation of the enzymes during blanching and by the sulphiting of the potatoes.

Niacin was determined by the microbiological method of Snell and Wright (3) using 1½ per cent sodium hydroxide hydrolysis as suggested by Andrews, Boyd, and Gortner (4) for cereal products. The media was made following the suggestions of Skeggs and Wright (5).

Because it was thought that the added fat in cooking Method *2* might interfere with the microbiological assay, some of the potatoes were subjected to Soxhlet extraction for 4, 8, and 16 hr. before analyses were made. The results are given in Table 2. Apparently the added fat was not sufficient to interfere with the determination of niacin.

Thiamine and riboflavin were determined by the method of Conner and Straub (6) with the modification of Moyer and Tressler (7) for the determination of thiamine in vegetables.

Total solids were determined by drying the potatoes at 70° C. under 28- to 30-in. vacuum. Approximately 2-gm. aliquots of the dehydrated potatoes which had been ground to 40 mesh in a Wiley mill were dried for 6 hr. From 20 to 30 gm. of the soaked, cooked, and held potatoes, and about 20 gm. of the cooking water and milk, which had been evaporated to a sirupy consistency on a low temperature hot plate, were dried for 48 hr.

Statistical treatment:

A statistical analysis was made of the percentage retention of each vitamin in the potatoes as served, to determine whether the observed differences were real or merely due to experimental variation. Standard errors were calculated and used in ascertaining by the "t-value" method as outlined by Snedecor (8) the significance, at the 5 per cent level, of the difference between (a) the different cooking methods, (b) the different holding methods, and (c) the cooking methods and the holding methods.

TABLE 1

The effect of increasing the strength of metaphosphoric acid on the stability of ascorbic acid in extracts of potato strips stored overnight at 37°F.

STRENGTH OF METAPHOSPHORIC ACID	ASCORBIC ACID CONTENT OF POTATO STRIPS*	
	Titrated immediately	Stored overnight
	mg./100 gm.	*mg./100 gm.*
2 per cent	.86	.86
3 per cent	.88	.87
4 per cent	.84	.86
5 per cent	.89	.88

* Moist basis.

DISCUSSION OF RESULTS

Vitamin content:

The ascorbic acid and niacin content of the potatoes before, during, and after preparation and holding are given in Table 3. These sulphited dehydrated potatoes contained on the dry basis, an average of 81 mg. (75 to 86 mg.) ascorbic acid and 5.7 mg. (4.2 to 7.1) niacin per 100 gm. Unsulphited dehydrated potato shreds studied previously in this laboratory contained an average of 76 mg. of ascorbic acid, .323 mg. of thiamine, .148 mg. of riboflavin and 6.15 mg. niacin per 100 gm. on the dry basis (9).

On the dry basis, the sulphited dehydrated potatoes contained .046 mg. of thiamine and .040 mg. of riboflavin, per 100 gm. The small amounts of thiamine and riboflavin contributed from a serving

TABLE 2

*The effect of added fat on the determination of niacin in potatoes**

FAT REMOVED BY SOXHLET EXTRACTION	NIACIN			
	Sample 1	Sample 2	Sample 3	Sample 4
hr.	*mg./100 gm.*	*mg./100 gm.*	*mg./100 gm.*	*mg./100 gm.*
0	.98	1.03	1.13	1.01
4	1.19	.97	—	—
8	.98	1.05	—	—
16	.93	.96	1.14	1.17

* Cooking Method *2*.

of these potatoes would probably be of little significance in the diet. Furthermore, accurate determinations of such small amounts would be difficult. Therefore, routine analyses of thiamine and riboflavin were not made. In previous studies in this laboratory on unsulphited and on sulphited cabbage, sulphiting increased the losses of thiamine during cooking (10, 11).

After four months storage in the unopened tins at room temperature, the dehydrated potatoes contained 59 mg. of ascorbic acid per 100 gm. on the dry basis or about one third less than did the unstored potatoes. They contained about the same amount of niacin, 7.0 mg. per 100 gm. on the dry basis. The potatoes were not packed in an inert gas which probably explains the loss of some ascorbic acid during storage in spite of the stabilizing effect of sulphiting.

During the storage of sulphited dehydrated cabbage for four months at room temperature (11), about one fourth of the ascorbic acid and one half of the niacin were lost.

The soaking water from the potatoes prepared by Method *2* contained .55 per cent solids, 4.1 mg. of ascorbic acid, and .26 mg. of niacin per 100 gm. on a moist basis. The soaking water from the potatoes prepared by Method *3*, containing .42 per cent solids, contained 2.8 mg. of ascorbic acid and .26 mg. of niacin on a moist basis.

The relatively small amount of cooking water drained from the potatoes cooked by Methods *1* and *2* contained 9 and 7 per cent solids, respectively. The cooking water from Method *1* contained 16 mg. of ascorbic acid and 1.2 mg. of niacin per 100 gm. on the moist basis; that from Method *2* contained 21 mg. of ascorbic acid and 1.5 mg. of niacin.

The cooking water drained from the potatoes cooked by Method *3* was a larger amount than that drained from the potatoes in either Methods *1* or *2* (Table 3). It contained 5 per cent solids and less ascorbic acid, 12 mg., and niacin, .95 mg., per 100 gm. on the moist basis. Since the quantity of cooking water was large, however, the percentages of solution of ascorbic acid, 25 per cent, and of niacin, 24 per cent, were the highest found in any of the cooking methods.

The cooking water drained from the stored potatoes after boiling (Method *4*) contained 10 per cent solids, 11 mg. of ascorbic acid, and 1.5 mg. of niacin per 100 gm. on the moist basis.

Vitamin retention:

The effect of five methods of preparation and three methods of holding on the percentage vitamin retention are given in Table 3. The results of the statistical treatment showing the standard error are also given.[3]

Cooking:

Apparently no destruction of either ascorbic acid or of niacin occurred during soaking; 85 and 82 per cent of the ascorbic acid and 92 and 105 per cent of the niacin were retained in the drained potatoes soaked by Methods *2* and *3* respectively. The water drained from the potatoes soaked by Method *2* contained 20 per cent each of the ascorbic acid and of the niacin; that drained from the potatoes soaked by Method *3* contained 16 per cent of the ascorbic acid and 26 per cent of the niacin.

The potatoes boiled by Methods *1* and *2* retained about the same percentage of ascorbic acid—82 and 84 per cent. About the same proportion of water had been used, and only a small amount of cooking water remained so there was little loss to solution—13 and 11 per cent. The potatoes boiled by Method *3*, however, in a slightly larger initial proportion of water and a considerably larger final proportion of water retained significantly less ascorbic acid, 56 per cent; 25 per cent was found in solution. The very small apparent destruction of ascorbic acid was probably because of the stabilizing effect of sulphiting on this vitamin.

Niacin retentions in the boiled potatoes ranged from the significantly low 56 per cent in the potatoes boiled by Method *3* to 97 per cent in the potatoes boiled by Method *2*. The amount of cooking water from the potatoes cooked by Method *2* was about one third as large as that drained from the potatoes cooked by Method *3*, owing to the greater evaporation during the cooking of the potatoes by Method *2* on the Army field range. During boiling, apparently little destruction of niacin occurred, ranging from 0 to 20 per cent. Losses to solution ranged from 9 to 24 per cent. The cooking water from Method *3* in which the largest proportion of water remained, contained the highest percentage of both ascorbic acid, 25 per cent, and of niacin, 24 per cent.

[3] Significant differences were found between:

Ascorbic acid

1b and 1c, 1d, 2d, 2e, 3c, 3d, 3e, 3f, 4d
1c and 1d, 3c, 3d, 3e, 3f, 4b, 5b
1d and 2c, 3d, 3e, 3f, 4b, 5b
2c and 3c, 3d, 3e, 3f
2d and 3d, 3e, 3f, 5b
2e and 3d, 3e, 3f, 4b, 5b
3c and 4b, 4c, 5b, 3f
3d and 4b, 4c, 4d, 5b
3f and 4b, 4c, 4d, 5b
4b and 4d
4d and 5b
3e and 4b, 4c, 4d, 5b

Niacin

3c and 2c, 2d, 2e, 4b, 4c, 4d
3d and 1b, 1c, 2c, 2d, 2r, 4b, 4c, 4d
3e and 1b, 1c, 2c, 2d, 2e, 4b, 4c, 4d
3f and 1b, 1c, 2c, 2d, 2e, 4b, 4c, 4d
4b and 1b, 1c, 1d
4c and 1d
4d and 1d
5b contained significantly more niacin than any of the others. This finding was probably due to the apparent increase in niacin during preparation, resulting from the probably erroneous, low assay value of the dehydrated samples for this study.

TABLE 3

The effect of five methods of preparation and of holding on the vitamin retention in dehydrated sulphited potato strips

COOKING METHOD AND HOLDING CONDITIONS	WEIGHT		TOTAL SOLIDS	ASCORBIC ACID*	NIACIN*	AVERAGE RETENTION** ± STANDARD ERROR				NUMBER OF REPLICATIONS
						Ascorbic acid		Niacin		
	Potatoes	Water				Vegetable	Liquid	Vegetable	Liquid	
	gm.	*gm.*	%	*mg./100 gm.*	*mg./100 gm.*	%	%	%	%	
1. Boiled in Army field range										
a. Dehydrated	3,175	13,610	94*	86	7.1					5
b. Brought to boil within 38–46 min. and simmered for 14 min.†	14,047	1,986	24	61	5.1	82 ±2.9	13	82 ±4.4	9	5
c. Drained, held in top of field orange for 30 min. at 199–219°F.†			24	54	5.0	70 ±1.5		81 ±5.5		5
d. Held in top of field range for 90 min. at 199–219°F.†			24	49	4.6	59 ±1.3		69 ±5.0		5‡
2. Boiled in Army field range, then scalloped										
a. Dehydrated	3,751	17,237	93*	84	6.4					5‡‡
b. Soaked for 30 min.	6,967‡	13,979††	49	72	6.0	85	20	92	20	5
c. Brought to boil within 45–91 min., and simmered for 10 min.	18,554‡	1,588††	19	65	5.8	84 ±7.6	11	97 ±4.7	11	5
d. "Scalloped"; evaporated milk, cooking water, salt, and fat added. Baked covered in top part of range for 30 min.†			21	47	4.9	69 ±3.4		89 ±4.4		5
e. Held in range with heat off (about 158°F.) for 30 min.†			21	43	5.2	64 ±2.5		94 ±7.9		5
3. Boiled on top of stove, then mashed										
a. Dehydrated	3,500	17,025	94*	75	5.1					4
b. Soaked for 20 min.	5,980‡	14,561††	55	61	5.3	82	16	105	26	2‡
c. Brought to boil within 38–41 min., and simmered for 10 min.†	13,790‡	5,182††	22	45	3.7	56 ±2.8	25	56 ±7.4	24	4
d. Beaten; hot milk, cooking water, and salt added, and beaten.†			22	38	4.1	47 ±2.7		54 ±5.1		4
e. Held in institution warmer at 140°F. for 30 min.†			22	38	4.2	44 ±3.4		53 ±4.7		4
f. Held in institution warmer at 140°F. for 90 min.†			22	34	4.3	40 ±2.8		53 ±5.3		4
4. Boiled in Army field range after four-month storage at room temperature										
a. Dehydrated	3,175	13,610	94*	59	7.0					4
b. Brought to boil within 34–47 min., and simmered 14 min.†	14,917	1,047	22	43	6.6	82 ±2.9	7	106 ±5.2	7	4
c. Drained, held in top of field range at 196–199°F. for 30 min.†			22	40	6.2	74 ±4.7		98 ±5.2		4
d. Held in top of field range at 196–199°F. for 90 min.†			23	36	6.2	67 ±3.7		95 ±3.4		4
5. Scalloped in Army field range										
a. Dehydrated	3,402	15,000	96*	78	4.2					5
b. "Scalloped"; evaporated milk, cooking water, salt, and fat added. Brought to boil within 46–62 min. in top part of field range. Cooked uncovered after reaching boil for 47 min.†			25	47	4.2	84 ±3.1		136 ±5.5		5

* On the dry basis.

** The percentage retention and solution were calculated on the moist basis, using the total weights of the dehydrated, rehydrated, cooked, mashed, and held potatoes, and soaking, cooking water, and milk in each lot.

† Vegetable as it was ready for serving.

†† One twentieth of these weights was removed for sampling.

‡ Niacin replications, 4.

‡‡ Niacin replications, 3.

During cooking, the potatoes which had been stored for four months at room temperature retained the same per cent, 82, of ascorbic acid as those boiled by the same method before storage. The niacin retention, however, was significantly higher.

Sulphited cabbage which had been stored for four months retained 13 per cent less ascorbic acid and about the same percentage of niacin during cooking as that which had been cooked by the same method before storage (11).

Calculations of the vitamin retention in the "scalloped" and in the mashed potatoes were based on the vitamin content of the added hot milk and cooking water as well as on the total vitamin content of the cooked potatoes to be baked or mashed.

During mashing procedures, which required 10 min., the boiled potatoes lost 9 per cent of their ascorbic acid. Niacin retention remained about the same. Fifteen per cent of the ascorbic acid and 8 per cent of the niacin were lost when the boiled potatoes were prepared as "scalloped" potatoes by Method *2*. These losses, however, did not prove significantly higher than those incurred during boiling alone.

During the preparation of the potatoes as "scalloped" potatoes by Method *5*, without previous boiling, a significantly higher percentage of ascorbic acid was retained than in the potatoes that were first boiled and then "scalloped" by Method *2*. In Method *2*, the draining of the boiled potatoes in an aluminum colander resulted in considerably greater contact with air and, therefore, more opportunity for oxidation of the ascorbic acid. Another explanation might be that no ascorbic acid was lost in discarded drained cooking water when the potatoes were "scalloped" by Method *5*. In each cooking, however, most, if not all, of the cooking water drained from the potatoes boiled by Method *2* was returned to the potatoes before they were "scalloped." The potatoes prepared by Method *5* also retained significantly more ascorbic acid than the potatoes prepared by Method *3*, both after boiling and after subsequent mashing. They apparently also retained more niacin. This apparent increase in niacin, however, is probably due to the unexplainably low and possibly erroneous niacin content of the dehydrated potato samples on which this calculation was based.

Holding:

During holding of the drained boiled potatoes prepared by Method *1* at 199° to 219° F. for 30 and for 90 min., a progressive and significant loss of ascorbic acid, up to 23 per cent, occurred (Table 3). A similar trend was noted in the stored potatoes which were boiled and held by the same method. Only a slight loss of ascorbic acid occurred either during holding of the "scalloped" potatoes for 30 min. at about 158° F. or during holding of the mashed potatoes at 140° F. for 30 min. and for 90 min. The shreds of the drained boiled potatoes were loosely packed in the container, and the enmeshed air probably hastened oxidation. Probably the mashed potatoes which were not noticeably "fluffy" did not contain sufficient enmeshed air to result in appreciable oxidation of ascorbic acid during holding. The "scalloped" potatoes were covered with milk and fat and so were protected from the air.

The range of retention of ascorbic acid during preparation and holding of these sulphited potatoes was from 40 to 84 per cent. This range was higher than that observed in a previous lot of unsulphited precooked dehydrated potatoes: from 13 to 60 per cent retention (9). This was no doubt chiefly due to the stabilizing effect of sulphiting.

Palatability and vitamin content:

The palatability scores and vitamin content of 100-gm. servings of the potatoes after preparation and after holding are given in Table 4.

TABLE 4

Vitamin content and palatability score of a 100-gm. serving of sulphited dehydrated potato strips prepared by several methods

COOKING METHOD AND HOLDING CONDITIONS	ASCORBIC ACID*	NIACIN*	PALATABILITY SCORE**
	mg./100 gm.	*mg./100 gm.*	
1. Boiled in Army field range, then drained and held in top of field range at 199–219°F.			
After boiling and simmering	15	1.2	9.4
After holding 30 min.	13	1.2	9.6
After holding 90 min.	12	1.1	10.0
2. Boiled in Army field range, then "scalloped" and held in top of field range with heat off at 158°F.			
After boiling and simmering	12	1.1	
After baking 30 min.	10	1.0	10.8
After holding 30 min.	9.2	1.1	10.9
3. Boiled on top of stove, then mashed and held in institution warmer at 140°F.			
After boiling and simmering	9.9	.82	
After mashing	8.3	.89	9.9
After holding 30 min.	8.3	.92	10.0
After holding 90 min.	7.4	.95	10.0
4. Boiled in Army field range after four-month storage at room temperature; then drained and held in top of field range at 199–219°F.			
After boiling and simmering	9.6	1.5	9.4
After holding 30 min.	9.0	1.4	9.6
After holding 90 min.	8.2	1.4	10.0
5. "Scalloped" in Army field range			
After baking	11.4	1.0	13.1

* On a moist basis.

** Scored on appearance, texture, and flavor. Highest possible score for each factor was 5 points, making the highest possible total score 15 points.

The "scalloped" potatoes prepared by Method *5* were judged most palatable, rating 13.1 points out of a possible 15. They were, however, more like mashed potatoes, although not as much so as those scalloped by Method *2* which were rated next highest in palatability, 10.8 points.

The main objection to any of the prepared potatoes was their slight sulphite flavor. The "scalloped" potatoes had the least of this flavor. Some judges, too, found this flavor far more undesirable than did others. No difference in the strength of the sulphite flavor was observed between the cooked unstored and the cooked stored potatoes. All of the potatoes were a good white color and had a desirable mealy texture. The mashed potatoes were quite acceptable except for a few tiny lumps and lack of fluffiness.

During holding little change in palatability occurred in any of the potatoes. Apparently some of the sulphite flavor was lost to evaporation, and the potatoes became drier and more mealy. The held boiled potatoes became slightly browned, which made them more acceptable to some of the judges.

A 100-gm. serving of the prepared potatoes contained from 8.3 mg. of ascorbic acid in the potatoes mashed by Method *3* to 15 mg. in the potatoes boiled by Method *1*. The niacin content of a 100-gm. serving ranged from .82 mg. in those boiled by Method *3* to 1.2 mg. in those boiled by Method *1*.

Little difference in flavor resulted when the liquid used in mashing potatoes in small quantity was varied. The flavor of the evaporated milk was thought by some to help mask the sulphite flavor. The potatoes from which the soaking water was discarded and which were boiled in fresh water and mashed with fresh milk were whiter in color and milder in flavor than the others, but were less mealy. The potatoes which were baked without preliminary soaking were considered good in flavor and texture; the potato shreds held their shape. The potatoes which were baked after cooking were equally good in flavor, but did not keep their shape and took a longer total preparation time as well as more handling.

SUMMARY

The palatability and the ascorbic acid and niacin retentions were determined in sulphited dehydrated potato shreds during four methods of large-scale preparation and three methods of holding of the cooked potatoes warm for serving. The palatability and vitamin retention during cooking the potatoes after storage for four months at room temperature was also determined.

The dehydrated potato strips contained on the dry basis an average of 81 mg. of ascorbic acid and 5.7 mg. of niacin per 100 gm. The stored potatoes contained about one third less ascorbic acid and about the same amount of niacin. These potatoes contained so little thiamine, .046 mg., and riboflavin, .040 mg., per 100 gm. on the dry basis that the retention was not studied.

The boiled potatoes with the least amounts of drained cooking water retained higher percentages of ascorbic acid, 82 and 84 per cent, and niacin, 82 and 97 per cent, than the 56 per cent each of ascorbic acid and of niacin retained by the boiled potatoes from which a larger proportion of water had been drained. The water in the latter study contained about one fourth of each vitamin.

No statistically significant change was noted in the vitamin retention of the boiled potatoes during the 10-min. mashing; 9 per cent of the ascorbic acid was lost. The potatoes which were baked without preliminary boiling retained a higher percentage of ascorbic acid and niacin than did the potatoes that were first boiled and then scalloped. They also scored higher in palatability and were more easily prepared.

During holding of the drained boiled potatoes for 30 min. and for 90 min., a slow progressive loss of ascorbic acid occurred. Some air was enmeshed between the shreds. The potatoes which had been stored for four months showed the same trend of loss, although to a slightly less degree than those boiled and held by the same method before storage. No significant loss of ascorbic acid occurred during holding either the "scalloped" or the mashed (not fluffy) potatoes. Undoubtedly the sulphiting helped to stabilize the ascorbic acid. Furthermore, little, if any, air was enmeshed in these potatoes.

A 100-gm. serving of the potatoes that had been "scalloped" without preliminary boiling, and that scored the highest of any of the potatoes in palatability, contained 11.4 mg. of ascorbic acid and 1.0 mg. of niacin. "Scalloping" the potatoes without preliminary boiling was not only a good method of preparation from the viewpoint of vitamin retention and palatability, but also from the viewpoint of ease of preparation.

The best method of boiling the potatoes from the viewpoint of both vitamin retention and ease of preparation was by adding them to a relatively small proportion of water, bringing them slowly to the boil and simmering them only until they were tender. Only a small amount of cooking water remained. A 100-gm. serving of the potatoes boiled by this method contained 15 mg. of ascorbic acid and 1.2 mg. of niacin.

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Food Habits in the Belgian Congo

The following description of food habits of the natives of darkest Africa is taken from a letter to Dr. Helen A. Hunscher, President-elect of the American Dietetic Association. It was written by a former student at Western Reserve University, Mildred Randall.

Wembo Nyama
Sac Prive
Lumsabo
Congo Belge

In the few weeks we have been here we have been studying some of the food problems of the villages, and I have spent many hours in the smoky grass huts watching the women cook their food. The following are some of the conditions and problems we have encountered thus far:

(a) There are no cows here (it is tsetse fly area); therefore, there is little meat and no milk, and there are no animals to help cultivate the soil.

(b) These Africans live almost entirely on three foods—millet, manioc leaves, and palm oil. Apparently they do not even consider fruit as food, for on detailed questioning, I sometimes learn that they also ate six bananas or two pineapples, but they say, "That is not food."

(c) In general, however, the natives do not eat much fruit, although they like it. They move their villages as soon as the palm trees grow tall enough to shade their huts and make them damp, and they do not like to plant fruit trees if they will not be on hand to harvest the fruit. On the other hand, they will not eat fruit another has planted for fear the owner has bewitched it. If one explains away the witchcraft, one must be sure to teach in its place that it is "immoral to steal." Otherwise, one produces a generation of thieves. It seems that one cannot teach good nutrition without teaching morals, too.

(d) The Africans here will not eat eggs. They are kept to hatch more chickens, yet they never feed their chickens or livestock, such as goats and pigs. The animals and poultry must find their own food, and as a consequence, are puny things.

(e) The natives do not know how to plan, and hence have "hunger" seasons with very little to eat until the next crop is harvested.

(f) The millet must be "towed" before eating, and there are no stones with which to do it. The natives hollow out a tree stump and grind the millet by pounding the grain with a long pole. It is hard work and takes a woman an hour to grind enough for eight servings (about 2 kg.).

(g) The Africans all seem to be anemic (so the doctors say), and it is small wonder considering how little protein they have. In addition, most of them are full of worms. At Wembo Nyama School, I am now making a "kitchen study" to estimate how much food the students eat. I know they are getting about one third of the amount of protein we would consider optimal, and 90 per cent of that is from vegetable sources.

I am at present working on a series of nine lessons on simple nutrition to be included in the science course next semester. However, I must teach the teachers first (in French, which they translate into Otetela for the students).

There is good soil and plenty of it here. The problem is basically an economic one. The people are intelligent if given half a chance to show their abilities. A little education in a mission school works wonders in dispelling old superstitions, but we need modern farm implements and a market for the food. Africa covers one fifth of the earth's surface and is large enough to sustain 800 million people, yet there are not more than 160 million inhabitants here. However, there are those interests which do not favor awakening the Africans to their potentialities in growing food for the world.

A Study of Plate Waste in a College Dining Room[1]

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DURING the fall and winter of 1945–46 a preliminary study of plate waste was made in the dining rooms at the Woman's College of the University of North Carolina, Greensboro. The room selected seated 400 and was used largely by upper classmen. The number actually served varied from 247 for a Sunday breakfast to 398 for a Saturday dinner. The study covered a week in November, followed by short periods before and after Christmas vacation and during semester examinations. The original purpose was to determine food dislikes among the students. However, it was found that the dietitian had already eliminated the most unpopular dishes. Nevertheless, unexpected variations in the amount of waste depending on the style of service and the meal make the study worth reporting.

PROCEDURE

To determine the total amount of food served, food was weighed as it was brought to the steam tables and leftovers were weighed and deducted at the end of the meal. Plate waste was sorted into metal containers arranged near the scrapping table. Some waste could not be completely separated, for example, rice and chop suey, but the amount involved was negligible. Inedible waste in fruit and in some other foods was estimated from tables for average refuse as given by Rose (1). It was recognized that this method was inaccurate, but the quantities involved made separating and weighing of inedible waste impossible. At breakfast, waste from cereal bowls was emptied into a colander so that the milk could be drained off and added to the milk left in glasses and bottles. The milk retained by the moist cereal was estimated by determining the increase in weight of a mixed sample of cereal when it was soaked in milk. The figure so obtained was used to correct the weight of moistened cereal left in the colander.

RESULTS AND DISCUSSION

As shown in Table 1, the style of service apparently influenced the amount of plate waste. Cafeteria service was used in the morning for breakfast and at noon, except on Tuesdays and Sundays; family service was used at night and at noon on Tuesdays and Sundays. On Tuesdays a required chapel period from 12 to 1 o'clock made the family service more efficient.

There was definitely more waste with cafeteria meals, although there was no difference in the variety offered. It is possible that with family service at tables for eight, there was greater opportunity to refuse foods than in a rapidly moving line. While it may be thought that a more adequate meal was eaten with family service, the present data do not warrant the assumption.

TABLE 1

Plate waste per person per day

DATE	BREAKFAST*		LUNCH*		DINNER**		TOTAL
	lb.	%	*lb.*	%	*lb.*	%	*lb.*
November 12	.22	17	.19	11	.06	6	.47
November 13	.39†	30	.12**	9	.07	6	.58
November 14	.21	23	.20	11	.09	9	.50
November 15	.27††	25	.14	13	.08	9	.49
November 16	.22	20	.11	9	.09	11	.42
November 17	.33†	31	.22‡	13	.09	8	.63
November 18	.25††	26	.29†‡§	24	.09§§	8	.63
December 20	.28	36					
January 3	.27†	27	.21	14	.15‡‡	12	.63
January 25	.34†	29	.14	13	.08	9	.56

* Cafeteria service.
** Family service.
† Half grapefruit served.
†† Whole orange served.
‡ Unpopular salad served.
‡‡ Pork chops served.
§ Supper.
§§ Served at noon.

[1] Condensed from a thesis presented by Rita Dubois in partial fulfillment of the requirements for the degree of Master of Science. Received for publication October 14, 1946.

[2] Professor of Home Economics.

Plate waste also varied with the time of day. The highest amount of waste occurred at breakfast and the least at night (Table 1). The proportion of waste at breakfast was usually much higher than at lunch, although cafeteria service was used for both meals. It was suggested that students are more hurried and less hungry at breakfast, but no data on this point were obtained.

At breakfast the percentage of waste in grapefruit, whole oranges, and milk was high (Table 2). Although some of the waste in grapefruit may have been fictitious due to a thicker-than-usual rind and the method of estimating inedible waste, inspection showed that it was very incompletely eaten. Pink grapefruit served at one supper gave a lower waste figure of 50 per cent. Whether this was due to greater popularity or to less hurried eating was not determined. The milk waste at breakfast seemed to be due to using part of the bottle for cereal and drinking coffee as a beverage. At other meals when milk was served, the waste was small.

TABLE 2

Percentage of edible plate waste of individual foods

FOOD	PERCENTAGE OF WASTE
Fruit	
Grapefruit	50–80
Oranges	41–60
Apples, bananas, pears	11–30
Salads	
Lettuce as base of salad	31–97
Head lettuce	17–85
Cabbage and green pepper, cottage cheese, macaroni, pear, potato, vegetable	30–40
Apple, pineapple, congealed vegetables	11–30
Cranberry, tomato	0–10
Vegetables	
Collards, potato soup, candied sweet potatoes, vegetable soup, rice or grits	11–20
Scalloped potatoes, peas	0–20
Green beans, steamed cabbage, carrots and peas, buttered or scalloped corn, creamed potatoes, mashed potatoes, browned potatoes, succotash	10 or less
Eggs—omelet, hard cooked, or fried	10–30
Fish	29–61
Meat	
Pork chops	39
Bologna, chop suey, corned beef hash, roast lamb, meat loaf, ground beef with noodles, sausage, turkey pie	20 or less
Desserts	
Baked apples*	55
Lemon rice pudding	29
Raspberry or cherry cobbler, cottage pudding, apple Betty, banana cake, apricots, fruit cup, fruit, gelatine, chocolate or lemon pie, ice cream	20 or less
Bread, hot	20 or less
Milk	
Breakfast	11–40
Lunch and supper	10 or less

* A few underdone ones were served inadvertently.

Waste at lunch was usually less than at breakfast, but more than at dinner (Table 1). On November 18, the Sunday night supper (listed as lunch) showed a high amount of waste due to the serving of both grapefruit and a macaroni salad. On January 3, no one food could be held responsible for the large waste. As a whole, lunch was not well eaten on that day.

Dinner waste was usually low, and the waste at dinner on January 3 was largely due to the meat left on the pork chop bones.

Waste of individual foods showed considerable variation (Table 2). Fresh fruits—apples, grapefruit, and oranges—were, comparatively speaking, incompletely eaten. Lettuce as the base of a salad was, at one meal, an almost complete loss. Head lettuce salad seemed fairly acceptable at one meal but not at another. Congealed and fruit salads showed less waste. In comparison with other foods, vegetables were well eaten, for waste in all cases was less than 20 per cent and often less than 10 per cent. Fish was reported by the students as unpopular, but on November 16 the waste was 29 per cent, the same as that shown for omelet and hard cooked eggs. More waste was shown for pork chops which, in a period of meat shortage, would have been expected to be popular. Inspection showed much meat left on the bones and even with a 20 per cent correction for inedible waste, the estimated edible plate waste amounted to 39 per cent. There was little waste of other meats. Except for baked apples, when a few underdone ones were inadvertently served, desserts seemed acceptable.

It was planned to study plate waste before and after the Christmas holidays and during mid-semester examinations to find out the effect, if any, of broken routine. Unfortunately, the day before the holidays was a poor one for such a study. Due to an emergency, classes were dismissed a day early on 12-hr. notice. Less than 200 were served at breakfast and waste ran to 36 per cent. It was impossible to estimate how much of this was due to the unexpected closing. On January 3, the first meal after the holidays, the waste was high but within the range of the week in November. Lunch on that day, however, was poorly eaten. No one food was responsible, but waste of everything seemed higher than usual. It was observed that there was much more talking than usual at that meal, the first with any leisure after the vacation, and it was suggested that visiting was substituted for eating on that day. Breakfast during the examinations gave a large amount of waste but not higher than was found during the November week. Evidently vacations and examinations had little effect, or else the effect was obscured by variations in the menu.

Most published studies of plate waste have been made in hospitals. Hageman (2) reported a variation of from 5.8 to 10.3 oz. per day for different groups of patients. Our study showed a daily waste figure of about 8 oz. Waste at breakfast could have been reduced by cutting the grapefruit or by serving juices. The labor problem made the first impossible, and the second was impossible because juices were unobtainable at the time the study was made. Waste of milk at breakfast could have been reduced by using a milk pitcher on the table rather than individual bottles, but this would create a sanitary problem. Table d'hôte meals always involve waste, but allowing students free choice in a cafeteria usually results in a poor diet. Even with the waste involved, the chances of a good diet seem best with a regular meal.

It is hoped to make further studies on the influence of waste on the adequacy of the diet. Whether variations in the style of service could be used to improve the diet should be investigated. The large amount of waste in grapefruit and oranges suggest a shortage of ascorbic acid. Individual dietary studies are needed to determine where changes in menu and where an educational campaign would be most effective.

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Digestibility of Fat

Misconception regarding the indigestibility of fat is common. Digestibility is ordinarily measured by comparing the amount of fecal fat with that ingested over a stated period; the difference, when adjusted for the more or less constant fecal lipid, is assumed to represent that part of the food fat which has been digested and absorbed. When calculated in percentage, the digestibility of fat is commonly above 95. Why, then, do physicians and laymen alike believe that fats and fatty foods are indigestible? The reason is that the satiety value of fats is high; the consciousness of fullness persists longer after a meal rich in fat than when other foods are consumed, and this in turn arises from the fact that fat retards the emptying of the stomach. Obviously, to consider digestibility in inverse relation to satiety value is a fundamental error.

Many studies of digestibility of fat have been carried out. Langworthy, summarizing the extensive investigation in this field, pointed out that fats of animal and vegetable origin show high digestibility in man. Hydrogenated fats are likewise highly digestible; by adjusting the melting point either through blending or through altering the degree of hydrogenation it was shown that the coefficient of digestibility varies inversely with the melting point. Holt and his co-workers showed that infants have the ability to digest and absorb fats efficiently, particularly if fats with long chain saturated fatty acids are eliminated. That heating of fat, as in deep fat frying, exerts little if any influence on digestibility has also been shown. Stearin, whether in mixed glycerides or in mixtures of fats, appears to decrease the coefficient of digestibility of fats. Of current interest is the evidence for the degree of digestibility of the fats in the margarines; Holmes long ago reported that the fat in oleomargarine is more than 95 per cent digested, and recent data have been published showing that the digestibility of the fat in the newer vegetable oil margarine is quite the same as that of butter when compared in human subjects.

Fat yields 9.3 calories per gram in metabolism and is, therefore, the richest source of food energy. Furthermore, the absorption of some fat is essential for the entrance of certain of the vitamins into the body. Reliable scientific evidence shows that fat is as well digested as are the carbohydrates and proteins, if not better, and that the source of the fat is of little importance. A clear distinction should be made between real digestibility and satiety value in assessing the dietetic value of fat.—*From an editorial, J. A. M. A. 132: 388, 1946.*

New Recruiting Folder

The folder, *Dietitians Are Urgently Needed,* has been so popular that the supply has been completely exhausted. To replace this folder and to make available up-to-date vocational information about dietitians, the American Dietetic Association has prepared an entirely new recruiting folder titled *Dietitians Are in Demand.* It is attractively printed in two colors and is well illustrated with photographs of dietitians at work. The information is, of course, authentic and timely. Copies of this new folder are available free of charge if requested from the headquarters office of the American Dietetic Association in Chicago.

Editorial

THE 1947 CONVENTION—PHILADELPHIA

The American Dietetic Association and the Philadelphia Dietetic Association are pleased to announce that the 30th Annual Meeting of the American Dietetic Association will be held in Philadelphia from October 13 to 17. All meetings and exhibits will be held at Convention Hall, while the headquarters hotel, where the welcoming luncheon and the banquet will take place, will be the Benjamin Franklin Hotel at Chestnut and 9th Streets. Arrangements have been made for bus service to and from the Benjamin Franklin to Convention Hall, with stops at other hotels to pick up members attending the convention.

Other hotels and their addresses suggested by the Philadelphia Convention and Visitors Bureau, in addition to the Benjamin Franklin, are: Adelphia, 13th at Chestnut Street; Barclay, Rittenhouse Square, East; Bellevue-Stratford, Broad and Walnut Streets; Drake, 1512 Spruce Street; Essex, 13th and Filbert Streets; Normandie, 36th and Chestnut Streets; Parker, 13th and Spruce Streets; Penn-Sheraton, Chestnut at 39th Street; Ritz-Carlton, Broad and Walnut Streets; Robert Morris, 17th and Arch Streets; St. James Hotel, 13th and Walnut Streets; Sheraton, 19th and Walnut Streets; Sylvania, Locust off Broad Street; Tracy, 36th and Chestnut Streets; Walnut Park Plaza, 63rd and Walnut Streets; and Warwick, 17th and Locust Streets. In writing for reservations, write directly to the hotel of your choice, stating a second choice. Members are strongly urged to make their hotel reservations early and wherever possible to plan to share accommodations.

Philadelphia—the City of Brotherly Love and the birthplace of our nation—should prove to be an unusually interesting city for our convention. It is a city of great historical interest, where William Penn brought his Quakers to settle under a grant by Charles II in 1682, where Howe billeted his army during the winter after the battle of Brandywine, and where the Constitution was written and signed. There are many historical landmarks to see—among them, Independence Hall where the Declaration of Independence was signed, Congress Hall where Congress met until 1789 and again from 1790 to 1800, and the home of Betsy Ross. There are innumerable cultural institutions as well. All in all, it is expected that the convention will provide much in the way of both professional stimulation and recreational enjoyment.

PUBLIC RELATIONS

What is meant by "public relations"? Is it similar to "publicity"? What is the area of responsibility? What attitudes and approach should an organization observe? These and other pertinent considerations have been covered in the February, 1947, issue of *Channels*, a publication of the National Publicity Council in an article entitled "The Positive Approach."

Actually, public relations and publicity are not the same. It was pointed out in the above report that "the unique characteristics of a Public Relations Committee arise from the fact that, unlike any agency grouping, it involves *continuing* services of a highly technical, diversified nature as well as policy evaluation and planning. Public Relations' area of responsibility is generally regarded as covering everything done by an organization which has or may have an impact on the public. Publicity's area of responsibility is smaller; it is generally confined to the dissemination of information. Publicity, therefore, is a tool of public relations. But an agency cannot have good publicity without a good public relations policy and program behind it, and a good public relations policy and program are meaningless without publicity to reflect them.

"*Publicity* is a highly specialized activity. It demands personnel with writing, speaking, and graphic skills, knowledge of communications media and the processes which create them, and an understanding of the agency about which they are disseminating information. Moreover, it demands these qualifications pretty much on a day-to-day basis, for the value of publicity often depends on timeliness and quick preparation. *Public relations*, in the broader sense, makes somewhat different demands. It requires personnel equipped to act in an advisory capacity on the planning level—members who have the ability and the knowledge to formulate a long-range policy, and who are able to grasp and evaluate the needs of an agency and translate them into public relations terms.

"Other committees in the agency structure do not often face the problem of encompassing both technicians and persons with a generalized 'feel' for their subject. They can usually confine themselves to policy-making as there is generally a paid staff to implement their policies. In the public relations sphere, however, paid staffs are relatively rare.

"In the few cases where there is one to carry on technical functions, the Public Relations Committee may confine itself to an advisory role. Where there is no paid staff, the Committee must also be capable of carrying on technical functions to the extent that existing staff personnel is not able to assume responsibility for them.

"Thus, committees fall into two general classes: the 'advisory'—which does not do the actual publicity or public relations job, but assists staff members in doing it, and the 'substitute staff'—which actually does publicity production, turning out newspaper stories, bulletins, folders, reports, scripts, etc., besides carrying on the non-publicity aspects of the public relations program, such as selecting objectives, carrying on research to ascertain how the agency stands in public esteem and where it is weakest, or training staff personnel to discharge individual responsibilities for good public relations.

"Organizing around given goals goes a long way to prevent the diffusion from which many committees and programs suffer, with attendant disappointment on all sides. At the same time, agencies must remember that a Public Relations Committee will not work well if it is organized merely to receive instruction and do a job wholly laid out for it. . . . Planning is a function that belongs to the Committee, and it should not be usurped by staff personnel. In organizing, therefore, staff personnel working with a Public Relations Committee must be careful to steer a middle course between commanding the group and letting it flounder around with no adequate concept of its function.

"Generally speaking, assignments on the Public Relations Committee of the 'substitute staff' type fall into two general classes, one requiring technical publicity skills, the other, a generalized 'public relations sense.' The former are essential to production, the latter are valuable in planning the program and acting as liaison with communications media.

"Flexibility of approach is the greatest single rule for agencies to observe in organizing and operating a Public Relations Committee. Publicity and public relations involve many intangibles of human relationships, and committees responsible for these activities cannot be operated according to blueprints or neat sets of formulae.

"Instead of trying to do that, agencies can best guarantee a successful Public Relations Committee by meeting each situation as it comes up, paying attention to the specific capacities, rather than focusing on what the Committee *should* be.

"All that is really necessary is the ability to view the Public Relations Committee as objectively as any other committee in the agency administrative structure, and not expect it to operate any more perfectly.

"When other committees develop clanking noises in their machinery, an agency will usually recognize that this is inevitable when human beings of varying points of view, interests, and capacities work together. This is a familiar problem for social service agencies, and agencies are accustomed to facing and solving it. . . . When they give less than complete satisfaction, there is no reason to suspend the calm judgment and attitude about the workings of groups which are so characteristic of good agency administration.

"When agencies are serious about doing a public relations job through a committee and are able and willing to give it the time and thought it deserves, and maintain a sense of balance and perspective, their committees will not fail."

PRELIMINARY REPORT OF THE PUBLIC RELATIONS COMMITTEE OF THE AMERICAN DIETETIC ASSOCIATION

The promotion of the dietetic profession—its individual members and its professional organization, the American Dietetic Association—is the goal toward which the Public Relations Committee should work. To achieve this goal, several paths and types of activities need to be followed to the end that the position of the dietitian is strengthened, a better understanding and recognition of the dietetic profession and its actual and potential contribution to the improvement and maintenance of national health are obtained, and the size of the profession is increased in numbers through an active and effective recruiting program.

THE DIETITIAN'S RESPONSIBILITY AS AN INDIVIDUAL

The dietitian who takes pride in her profession, who reflects enthusiam and interest, and who considers her work an opportunity as well as a challenge is the best and most effective emissary of the dietetic profession. This public relations program is, therefore, the responsibility of every dietitian. She should make her profession known by a "job well done" and personally serve as its ambassador.

Such work should start in the institution, school, or business with which she is affiliated. Too often, we assume that the agency employing the dietitian or maintaining a dietetic staff is "completely sold" on the service the dietitian is able to render. When this is true, it is indeed a happy state of affairs, and every effort should be made to preserve it, to build on it, and to extend its good influence to other organizations.

A number of ways have been suggested by which the dietitian may promote cooperation and understanding. Newsletters to co-workers, patrons, patients, and allied professional staffs may be circulated, telling, for example, bits of news about the dietary department and its established and/or

changing policies. Bulletin boards may also be used for disseminating similar types of information.

The dietitian should also be alert in recognizing opportunities for extension of her services. It is likewise important for her to recognize the role of her department within the total organization and to coordinate her work with that of other departments so that good relationships, efficiency, and increased accomplishment may be established. Conferences with other departments on topics of mutual interest promote the feeling that the dietary department is an integral part of the whole organization.

It is important that the dietitian take an active interest and part in community affairs and activities of related professional groups. In so doing, she should make known, whenever possible, her profession and its functionings.

PROFESSIONAL RESPONSIBILITIES OF THE DIETITIAN

Belonging to an organization is a privilege which also carries with it a responsibility—a responsibility which goes further than the mere paying of dues. Each dietitian will appreciate the goals, ambitions, and work done by her profession and the value to herself of professional affiliation if she takes an active part in the work of her organization. This participation will, at the same time, strengthen the organization and will develop in her an awareness of the scope of the work of the dietitian, the high standards of the profession, and, in addition, create a respect for the dignity of the profession of dietetics.

Each member will realize the value of active membership to herself and to her Association only to the extent to which she actively participates in the work of her professional organization. The growth and development of the Association, in turn, depends upon the dietitian, the individual.

As individuals, all dietitians must be willing to assume responsibilities when asked and to assist in developing a program in which all members may take part. The "seasoned" dietitian should also encourage, guide, and promote the young dietitian in active Association work and should step aside as the leader, guiding the young members to develop leadership, vision, and the desire to share their abilities with others. Approved and recommended plans should be put into action without delay, for a job well done as an Association, makes the dietitian a member of a respected professional organization.

As concerns the national Association, each member should feel an obligation and responsibility to act upon policies and requests made and to report promptly on work done. The national organization constantly urges members to keep it informed of all activities and work accomplished.

Delegates from state associations should be kept informed on current legislative problems, so that they may in turn present the thinking of their state associations to the House of Delegates of the national Association. The House of Delegates is the legislative body of the Association, and the national Association can help only on "known problems," and can be guided in its thinking and action only when the members' thinking is made known through the delegates. It follows, therefore, that the business meeting of the national organization vitally concerns each member. To keep abreast of Association activities, the dietitian should read the JOURNAL, the *Annual Reports and Proceedings*, and the state bulletins, which frequently publish material from the *A.D.A. Courier* intended to inform state associations of the national Association's thinking and activities.

By making the A.D.A. an integral part of her job each day, the dietitian will promote, develop, and fulfill the national Association's recommendations, whether it be policy, job standards, or professional activities, and she will then realize to the fullest extent the satisfaction and enjoyment of a job well done professionally, which, as a consequence, results in the best of "public relations."

In addition to opportunities for service with the national Association, there are many channels for work open in the state and local associations, and the dietitian's active support of these organizations is of equal importance.

Local associations may be made an integral part of the state associations, with each section a division of the state association as regards organization and work program. Reports of local association activities should be made to the state associations voluntarily and not on request only. The dietitian should exhibit a willingness to take an active part in all state association activities and contribute to the work done. She should also make her problems and interests known to the state association, for it is in this way that many interesting and helpful programs originate.

The state bulletins should be used as news vehicles of members' activities. They can also serve as a means of informing those with whom the dietitian works and for whom she works of dietitians' activities in general.

Some local associations have found that meetings, such as luncheons, dinners, and open houses, with superintendents and officials who maintain dietary staffs and/or who contemplate establishing such departments are an effective means of increasing mutual understanding and appreciation of the dietitian's work. In some instances, they have even been influential in the establishment of new departments.

PRESS AND RADIO RELATIONS

Relations with the press and radio should always be friendly, cooperative, and helpful. Every effort should be made to present and interpret the dietetic profession to the public through the press, radio, and

periodical publications. Although personal items of activities of individual members and notices of meetings have their place, more in the nature of public relations can be done through articles presenting the work and purposes of the dietitian, for this field is still so new that it has *news* value.

When the dietitian is asked to give news about her work, she should give it clearly and simply, remembering always that the interviewer does not (usually) have her background of understanding and knowledge. It is up to the dietitian to "sell" her work and profession.

When news of general interest occurs within her department, she should pass the information along to either the publicity department of the institution or organization by which she is employed or to the special writers of the newspaper or radio with whom she has had contact.

If notices of special meetings are desired, a call to the club editor of the newspaper should be made to find out how the material should be submitted and the time at which it is wanted. Then, compliance with these rules will bring best results. If a meeting is to be large, with a well-known speaker and a program of general interest, a personal call on the editor or city editor of the newspaper will generally insure coverage. When there are several newspapers in a city, deadlines of each should be respected. Information about an event occurring in the morning or early afternoon should be given to afternoon papers for coverage. An evening event should be reported in morning papers.

The dietitian can also do much toward improving the information given on foods and food subjects in the daily papers and radio through letters of commendation or constructive criticism, graciously given, to the editor. The opinion of professional people is highly respected in the radio and newspaper fields, and letters are held in strictest confidence. The best way to insure accurate information on food, nutrition, and dietetics is for the dietitian and local association to take an active and always cooperative interest in material appearing in the newspaper and on the radio.

RECRUITING PROGRAM

This is a separate program which should be directed to high school and college students. In high schools, the objective should be to influence girls to study home economics. In college, students should be encouraged to elect dietetic courses, and ultimately (for qualified graduates) to follow through with dietetic internships.

Dietitians should work with vocational guidance leaders in high schools and colleges, supply informational material to school and public libraries, organize talks to high school and college classes, and contact deans of women in colleges as well as home economics classes in high schools and colleges.

The editors of magazines catering to girls of high school and college age, i.e., *Seventeen*, *Glamour*, *Mademoiselle*, *Charm*, and so on, should be told about dietetics and offers should be made to prepare articles, with the cooperation of the magazines' vocational guidance departments, on the opportunities of the profession. The women's magazines should also be contacted, since parents, as well as daughters, need to be "sold" on our profession. Members of national fraternities should not overlook the audiences which their publications reach—*Helen Robertson, chairman, Elizabeth Perry, co-chairman, E. Neige Todhunter, and Helen C. Hamilton.*

TWENTY-THREE YEARS OF SERVICE

A Placement Bureau for the members of the American Dietetic Association became a real functioning service twenty-three years ago this month. It was first started as a service to aid members of the Association in locating desirable positions which were not as numerous in those early days as they are today. While this objective continues to be a primary one, there are other advantages and services available through the Placement Bureau, and the results of these services have been far reaching.

Employers of dietitians and nutritionists are becoming more and more cognizant of our Association and the standards which it maintains. Every assistance possible is given to these employers who are in the need of the services of a dietitian. This is done first by referring to them registrants of the Placement Bureau who seem to be qualified for the position open, and second by sending the credentials of registrants who are applying for the position to the employers for their consideration.

Over a period of years the Placement Bureau has proved to be a vital center of good public relations. Employers have often expressed their surprise and appreciation of the caliber of applicants referred by our Association. More than once letters have been received from employers stating that they had never before realized the amount of education and training required of our members. Also they have expressed the hope that they might always be able to obtain the services of American Dietetic Association members for their staffs. Is this not one of the best means of informing people about ourselves and the profession we represent?

At times, however, it has been regrettable that credentials requested for a candidate for a certain position were not available because that particular member was not registered in the Placement Bureau. It has been the expressed hope of the Executive Board and of the Placement Bureau Board that each member of the Association might have her credentials on file in the Association headquarters office. Thus, if information about members should be requested, it would be available. This information

would be of value not only to prospective employers, but it would also provide a source of data for other purposes. On occasion, the professional records of members are needed by committee chairmen, editors of the JOURNAL or state bulletins, and other similar publications. Frequently the only information kept on file concerning a member is that which appears on the original membership application form, and this is a far from adequate record of background and experience.

These are some of the reasons that it would be to your advantage, as a member of the American Dietetic Association, to be registered in the Placement Bureau *even though you are not interested in obtaining a position through the Bureau.* It does provide a central place for keeping the record of your experience and the letters of recommendation from each of your employers, from your college professors, and others. It keeps your record in a form which is available for use at any time.

If you have not used the Placement Bureau services for some time, it would be wise to have your record brought up to date. It is much easier to have those letters of recommendation written for you *now* while you are well remembered by those with whom you have worked than to wait until it is difficult to locate these employers. If you are uncertain as to whether you have registered with the Placement Bureau, your record will be checked for you upon request. If you should be in Chicago, you are welcome to visit the Association headquarters office to see where and how your record is kept and to discuss positions which are available.

Members often ask if the Placement Bureau ever lists positions outside of the hospital field. The answer is definitely, *yes.* At the present time the Placement Bureau has openings listed in college food service, college and university teaching, school lunchroom management, commercial and industrial feeding, and in public health nutrition which includes positions with the U. S. Public Health Service, the American Red Cross, and with state, city, and private welfare organizations. The commercial types of positions include those with restaurants, cafeterias, airline food service for both terminal and in-flight feeding, hotels, clubs, and department store tea rooms.

In the hospital field there are a few positions for chief dietitians, and many for assistants and inexperienced dietitians. The hospitals listed include those from 40 to 4400 beds, private and public, located in cities and small towns. The Veterans Administration hospitals and the U. S. Public Health Service hospitals have good openings available, and assistance is being given to them in their recruiting of dietitians.

From now until summer there will be many calls for dietitians for summer camp and resort positions.

There are now some eight hundred available positions on the Placement Bureau records. In April of 1942 there were 195 positions listed. These figures readily show the increased demand for dietitians over the last five years. Postwar building plans, revised budgets to allow for additional staff members, and the ever-increasing desire on the part of employers to have A.D.A. members, or "qualified" dietitians, in their employ are all reasons for the great number of positions now listed.

How many members are there available to fill these positions? Whatever the number, there are not nearly enough, as anyone who has tried to employ a dietitian recently will verify. There are approximately 240 members in the active files of the Placement Bureau—240 members who have expressed interest in obtaining new positions. Of this number, some 115, however, are already employed and merely wish to *change* positions, leaving 125 who are unemployed and available to fill some of the 800 vacancies. This is not an accurate estimate, however, for there are unemployed members who are not Placement Bureau registrants. If you are one of these members and are interested in obtaining a position, or in having your record brought up to date, will you let us know? We, as a professional group, have a definite responsibility to fulfill, and only by the cooperation of each member may we hope to meet the great demand for our services.

Forms for Placement Bureau registration were recently sent to each member of the Association. Also, these forms were forwarded to the directors of courses approved by the Association, together with a letter urging the directors to have all dietetic interns register in the Placement Bureau at the time they apply for membership. Thus, it is hoped that every member and every graduating intern who is applying for membership will become registered in the Placement Bureau.

Some of the details concerning the operation of this Placement Bureau for American Dietetic Association members follow:

HOW TO REGISTER WITH THE PLACEMENT BUREAU

1. Fill out the Registration Blank and send it, together with one signed copy of the TERMS OF AGREEMENT and the registration fee, to the Association headquarters, 620 North Michigan Avenue, Chicago 11, Illinois.

2. Letters of recommendation will be collected for you from the names you give as references on the registration blank. Be sure to give complete addresses. References which are now on file with your college or university placement bureau may be obtained for your A.D.A. placement record. Please indicate on the registration blank if your letters of recommendation are available through this source. References are not obtained from, nor sent to, commercial employment agencies.

3. If you wish to be notified of positions open, you will be an Active registrant, and the fee is $2.00. If you are not interested in changing positions at the present time but wish to have your credentials assembled and kept on file, you will be an Inactive registrant, the fee for which is $1.00.

EXPLANATION OF PLACEMENT BUREAU FEES

1. *Registration Fees*

a. Initial Registration. The fee is $2.00 to be an Active Registrant and to be notified of positions open; or $1.00 to be an Inactive registrant. (Inactive registrants are entitled to have their credentials sent to prospective employers at any time, but are not notified of positions through the Placement Bureau.)

b. Transfer from Inactive to Active. A member who first registered inactively may at any time, upon the payment of an additional dollar, be transferred to the active files and be notified of positions open at that time.

c. Re-registration. The initial, Active registration fee of $2.00 is good for one year *after* the time the registrant is placed in a position through the Placement Bureau. If she again wishes active Placement Bureau service after that time, a $2.00 re-registration fee would then be payable. If an active registrant obtains a position through other sources than the Bureau, her record is transferred to the Inactive file. If at any time in the future she again wishes Placement Bureau service, her record will be placed in the active files at no additional charge.

2. *Placement Fee Rates.*

a. The placement fee for a position obtained through the Placement Bureau, and which is understood at the time of placement to be a permanent one, is $15.00.

b. The placement fee for a position obtained through the Placement Bureau, and which is understood at the time of placement to be a temporary one, is $10.00.

c. These placement fee rates are payable in accordance with the TERMS OF AGREEMENT of the Placement Bureau.

New Appointments, Veterans Administration

The following hospital appointments of dietitians (not previously announced) have been made by the Veterans Administration.

Name	Position	Location
	Branch No. 1	
Genevieve Millett	Staff Dietitian	Staten Island, N. Y.
Gertrude Pless	Staff Dietitian	Staten Island, N. Y.
	Branch No. 4	
Ruth Wallace	Staff Dietitian	Roanoke, Virginia
	Branch No. 6	
Maxine Boudeman	Staff Dietitian	Lexington, Ky.
Anna Bryson	Staff Dietitian	Cleveland, Ohio
Mabel O'Donnell	Staff Dietitian	Dayton, Ohio
Marian Sather	Staff Dietitian	Lexington, Ky.
	Branch No. 7	
Jeanne Fuller	Staff Dietitian	Hines, Ill.
Josephine Pheasant	Staff Dietitian	Downey, Ill.
	Branch No. 8	
Helen Melander	Staff Dietitian	Minneapolis, Minn.
Lorraine Yoerg	Staff Dietitian	Knoxville, Iowa
	Branch No. 9	
Dorothy Ellen	Staff Dietitian	North Little Rock, Ark.
Margaret Leahy	Head Dietitian	North Little Rock, Ark.
Marybelle Opfer	Staff Dietitian	Wadsworth, Kans.
Mary L. Reid	Head Dietitian	Topeka, Kans.
Margaret Wylie	Staff Dietitian	Springfield, Mo.
Emelia Zane	Staff Dietitian	Wichita, Kans.
	Branch No. 12	
Jennie M. Ballard	Staff Dietitian	Van Nuys, Calif.
Frances Beck	Staff Dietitian	Los Angeles, Calif.
Dorothy D. Dowell	Staff Dietitian	Van Nuys, Calif.
Betty Lou Guge	Staff Dietitian	Van Nuys, Calif.
Mary Isaacs	Asst. Chief Dietitian	Los Angeles, Calif.
L. Jean Murdock	Staff Dietitian	Los Angeles, Calif.
Virginia O'Neil	Staff Dietitian	Van Nuys, Calif.
Genevieve Scheier	Staff Dietitian	Los Angeles, Calif.
	Branch No. 13	
Ella Wishor	Staff Dietitian	Albuquerque, N. M.

Current Comment

CHANGING FROM THE SPLIT SHIFT TO THE STRAIGHT SHIFT IN THE HOSPITAL

ELIZABETH PERRY

Chief Dietitian, City Hospital, Cleveland

This is the "workman's day." He has a strong voice in all labor policies, and administrative people have found that personnel morale and job satisfaction is important factors in achieving a well-organized and efficient organization. One step in achieving good morale which deserves serious consideration by hospital administrators is the straight shift of hours for dietary employees.

The split shift was originally established because hospitals were built to provide housing space for employees. It was felt that once such an investment had been made, it must be supported, and thus the employee was required to accept full maintenance in lieu of part of his or her salary. This naturally decreased the actual cash outlay necessary to meet the payroll, and as a corollary, the employee's entire life was centered in the hospital atmosphere, during leisure time as well as during time spent on the job.

Today the employee wishes and demands more independence in his mode of living, and the split shift still hampers his ability to achieve this desire. As we all know, the spread of hours on the split shift is usually 12 hr.—9 hr. on duty and 3 hr. off in "waiting time." This waiting time in itself has proved a problem, for adequate rest rooms must be provided where employees may spend their waiting time. Supervision of these rooms is needed, for it is there that employees "hatch" and air grievances with fellow workers, which may develop into momentous problems, even though they may have started only as minor personal grievances.

Thus the importance and necessity of change from the split shift to the straight shift under today's working conditions has become obvious.

To the administrative dietitian whose department is organized with job breakdowns based on the split shift, the change to a straight shift plan of operation may seem to be an almost insurmountable problem and one which will require more employees. This, however, has not been found to be necessarily true. When the first step—the revision of all work schedules and hours has been accomplished—it often develops that with one shift of employees working 8 hr. at a time, the duties of the individual jobs can be greatly increased, thus making it possible to remove one or two employees from one shift and reassign them to another.

There are no set rules to use in changing from a split shift to a straight shift. The physical set-up, adequacy and type of equipment, hospital policies and practices, responsibility of the dietary department, type of service to the patient and to hospital personnel, adequacy of supervision, training programs, and many other factors will play important roles in determining how the change is to be made. In some instances, additional employees *will* be needed; in others, only rearrangement of duties will be necessary.

To illustrate one way in which this change may be accomplished, it may be helpful to describe in detail the experience of City Hospital in Cleveland. In this hospital a decentralized system of food service is used for patients' trays, and cafeteria service is provided for the hospital personnel. There are two production units, one known as the Main Kitchen and the other as the Nurses' Home Kitchen.

The Main Kitchen is the center of all activities from which other departments operate. This unit prepares all food for the patients, receives store supplies, and has as auxiliary units the bake shop, butcher shop, a miniature diet kitchen, and large vegetable preparation room. The Nurses' Home Kitchen is the food production unit which serves food for the hospital personnel. All food served here is requisitioned from the Main Kitchen.

In considering the change, three units had to be considered—the Main Kitchen which was a unit only for production; the Nurses' Home Kitchen, which was both a production and service unit; and the Patient Service in the ward kitchens, which involved the kitchen maids' schedules.

The first step was a review of the organization and working schedules, which served as the keynote in changing hours without the necessity of an increase in personnel. Next, a job breakdown of each job in each unit as it was then performed was made. This was followed by a study to determine the minimum number of employees needed for complete coverage of all work. After these three analyses had been made, it was possible to make a reorganization

of job responsibilities. The first problem was that of having too many employees on duty during the middle of the day in order to have enough employees for the early and late shifts.

In the Main Kitchen two changes were made to improve the operation of the kitchen and the food served. First, a production line for loading food carts was inaugurated, thus eliminating the duties of the "floor men" who had previously loaded and unloaded the carts for each meal. Next, the help of the nursing department was solicited for the loading of the forty carts three times daily. Orderlies from the nursing department customarily came for the carts, and the nursing department agreed that they should take them from the cart room to the Main Kitchen through the production line. This took very little of the orderlies' time, for only 10 min. were needed from the time the first cart arrived in the kitchen until the last one was loaded and ready to leave. The orderlies were also asked to unload the containers and put them on the carts designated when the carts were returned to the cart room.

By making these two changes, the work of the floor men was eliminated, all work was done more easily with less lost motion, and it was possible to establish the straight shift of hours, which in turn allowed more and varied duties to be assigned to the individual employees. It was also found that less time for the preparation of food and its service to the patient was needed.

The operation of the Special Diet Kitchen was given special study and changes were made which materially decreased the work to be done. A review of the planning of all therapeutic diets was made, as well as a study of all master menus. With the master menu as the basis for planning all therapeutic diets, duplication of food production was eliminated. The diets were assembled on the divisions. This change resulted in better prepared food for the therapeutic diets. The increased work constituted "paper work"—that is, a more careful correlation of food items on house diets and therapeutic diets.

When a similar review of organization and job breakdowns were made for the Nurses' Home Kitchen, problems similar to those of the Main Kitchen were presented—mainly, not enough employees for the early and late shifts. To meet this problem, breakfast was changed to cafeteria service from table service, thus releasing enough employees to cover the evening service adequately. In this unit, as in the Main Kitchen, work schedules were reorganized, and some work previously done in this unit was transferred to the Main Kitchen. More recently, cafeteria service has been established for all three meals in the Nurses' Home Kitchen, which made possible a reduction in the number of employees.

The third unit to be reorganized was the ward kitchen set-up on the divisions. This presented a difficult problem, since, despite the fact that three meals must be handled each day, at no time did the work warrant using two employees in one kitchen. Again, the cooperation of the nursing department was requested, and a regular ward maid was assigned to the kitchen to handle the breakfast service. At 10 a.m., the kitchen maid, a dietary department employee, came on duty and completed the day's work. By following this schedule, the kitchen maid had time to do much more cleaning and extra work.

The dietary departments of a number of other Cleveland hospitals have in recent years also changed from the split shift to straight shift of hours. A few years ago the Cleveland Hospital Council made a survey of the question of straight shift of hours vs. split shift. The study was made at a time when some hospitals were making the change and others were considering its possibilities. The experiences of four hospitals, as reported in this survey, will be summarized briefly in an attempt to show other ways in which such a change in operation can be made.

Hospital No. 1. To change the work in the Service Unit as it concerned tray service to the patient, a new schedule was planned whereby ward kitchen maids employed by the dietary department were assigned only to the noon and evening meals. This shift was scheduled from 9 a.m. to 6 p.m. Breakfast was served by ward maids, employed by the nursing department, who were scheduled to do nursing department work after breakfast. To take care of food service to the hospital personnel, cafeteria service was installed for breakfast. This relieved all of the waitresses for the other meals, and thus made a straight shift possible.

In the Production Unit, work schedules were also changed. Duties of each job were analyzed and then broken down so that the completion of a job was accomplished by an employee on a later shift. In addition, varied duties were assigned to each employee.

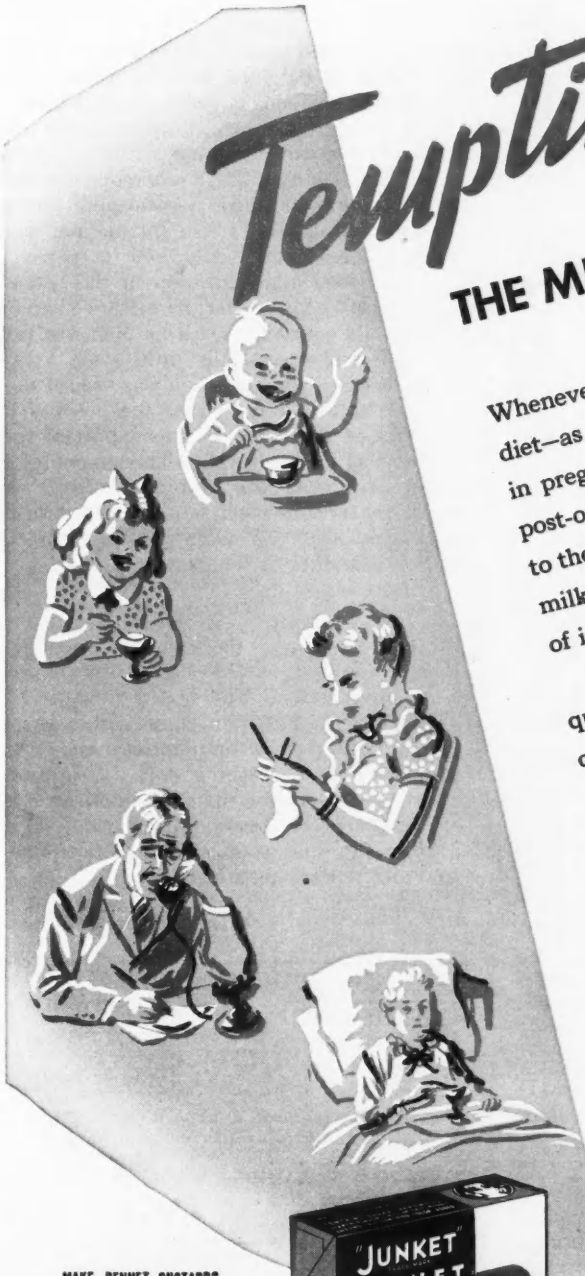
Hospital No. 2. In the Service Unit, after the straight shift was inaugurated, helpers, under the nursing department, assisted in serving breakfast and dinner, and the dietary department maids were scheduled for the early or late shifts. This arrangement required two employees in the serving units at each meal.

In the Production Unit employees were assigned straight shift hours, with duties scheduled as in Hospital No. 1.

Hospital No. 3. With the use of a straight shift schedule, junior kitchen helpers in the Service Unit were scheduled to work from 7 a.m. to 10 a.m. in the serving pantries. From 10 o'clock to 4 p.m., they perform duties in the kitchen and cafeteria. The senior kitchen maids were scheduled for work in the pantries from 10 a.m. to 7 p.m.

Tempting

THE MILK-JADED PALATE



Whenever milk is an important "must" in the diet—as throughout infancy and childhood, in pregnancy, gastrointestinal and post-operative conditions, etc.—appealing to the eye and palate by "dressing up" milk is frequently the only means of insuring an adequate intake.

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In the Production Unit all employees were also assigned to a straight shift, which operated very much as that described for Hospital No. 1. No additional employees were needed to make the change.

Hospital No. 4. In this hospital, which has a centralized service, the change to a straight shift was made by rearrangement of duties of all employees. Full-time employees were scheduled for the early shift and took care of the morning and noon meals. Part-time employees were used for the evening meal.

In summary, then, the steps which may be used in changing from a split shift to a straight shift of working hours for employees in a hospital dietary department are:

(a) Review the general organization of the department.

(b) Make a job breakdown of all established jobs.

(c) Determine the minimum number of employees needed for each shift or for complete coverage.

(d) Reorganize the job responsibilities and duties.

(e) Ask cooperation of other units if necessary.

(f) Organize duties of each job so that jobs may be done with the least amount of lost motion.

(g) Employ part-time workers for service of one meal if there is not a sufficient amount of work to warrant full-time personnel.

The change from the split shift to the straight shift may be expected to promote a more efficient and satisfactory dietary service and greater satisfaction among employees, for they will also feel more responsibility toward their jobs.

ORGANIZATION OF A NUTRITION CLINIC IN THE VETERANS ADMINISTRATION[1]

KATHRYN A. MCHENRY

Chief, Dietetic Division, Veterans Administration Branch Office No. 7, Chicago

Educational programs in a Veterans Administration Hospital have been previously described (1). It is the purpose of this paper to describe the operation of a nutrition clinic and indicate its contribution to the care of the patient, as outlined by the doctor, and to educational programs.

In 1929 in cooperation with the out-patient department of the Veterans Administration Hospital, Hines, Illinois, steps were taken to develop a nutrition clinic. Inasmuch as existing law provided, and still provides for out-patient treatment only for service-connected cases, a very small percentage of veterans were benefited. Early in 1930 as a result of economy, the position of clinic dietitian which had been established for the out-patient department was abolished.

A great need existed in the hospital for teaching and training patients, some of whom would later become out-patients of the Veterans Administration, be required to seek care elsewhere, or be rehospitalized to procure treatment.

A plan was established whereby instruction was given to patients whose post-hospital care required dietary management. The instructions were given in groups and individually, and the person responsible for food administration in the home—either the patient's wife, sister, or mother—was asked to attend the instructions. This plan was carried on more or less successfully until 1944.

A full-time clinic dietitian was needed to instruct the patients and to relieve the hospital dietitian to carry on her work. It was important to procure a specialist in clinic work. The temporary arrangement of having the hospital dietitian do clinic work was far from ideal, but it did keep the program alive and supplied much needed help to many patients and their families.

ORGANIZATION

After personnel, the question of organization which would meet the existing needs was given exhaustive study. The best plan appeared to be to establish a nutrition clinic within the hospital which would care for both hospital and out-patients and serve as a teaching unit. The organization chart (Fig. 1) places the clinic dietitian under the instructor in dietetics and the chief dietitian to further the unification of library reference service and diet therapy planning.

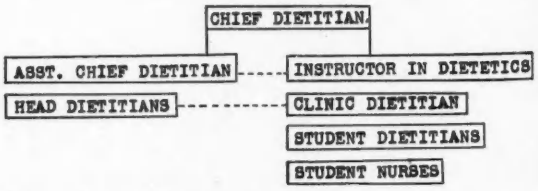

FIG. 1. *Organizational chart, Nutrition Clinic, Veterans Administration, Hines, Illinois.*

As soon as a patient is admitted to the hospital and a special diet is ordered, usually after consultation by the physician with the dietitian, the patient is visited by the physician, nurse, and dietitian, who make up a treatment team. In addition to supplying a special diet, as much instruction as the patient is physically able to accept is given. Corrective instruction in eating habits, instruction in normal nutrition, and diet therapy are given as indicated. By the time the patient is ambulant, he is usually well grounded in his dietary needs and in the acceptance of a restricted diet.

The Veterans Administration patient is usually ambulant for a time before discharge. During this period, rehabilitation treatment is usually given

[1] Published with permission of the Chief Medical Director, Veterans Administration, who assumes no responsibility for the opinions expressed.

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through a clinic, including nutritional instruction.

During private conferences the patient's case history is obtained, including economic circumstances, family responsibilities, and eating habits. This, of necessity, must include some information concerning race and creed, if a diet is to be planned which the patient and his family may reasonably be expected to use.

While making rounds with the physician, the dietitian is given a list of patients who are to report to the clinic for group instruction. This list clears through the office of the head dietitian of the unit for record and reference purposes.

Patient instruction includes writing menus, usually for a period of one week. Next, the patient is taken to the cafeteria or dining room to select his food under the guidance of a dietitian. He is instructed in food selection, and special attention is given to the lunch he may carry to work. Corrections are made and reteaching is carried out when indicated. Discharge instructions are prepared, approved, and issued.

Throughout the above procedures, the physician works closely with the dietitian, the nurse, the student dietitian, and the student nurse. Patient cooperation and integrated teamwork in the treatment of the patient is the goal.

The clinic serves as a clearing house and coordination center for dietary treatment in the hospital, for auditing of pertinent literature on nutrition and dietary treatment, and for distribution of information through conferences and in mimeographed form to the doctors, dietitians, and others concerned. The clinic also provides a valuable teaching center for student dietitians and nurses. Plans for resident doctors are being developed in connection with the program. While the student dietitian is in the clinic, she has an opportunity to teach patients under the supervision of the clinic dietitian. In addition, she makes rounds with the treatment team.

The student nurse receives lecture and laboratory work in normal nutrition while working on the medical floor. She is then assigned to the dietetic section for practice work, for lectures, and laboratory classes in diet therapy, and at the proper time during her experience follows cases through complete treatment, including attendance at the nutrition clinic with the patient or patients.

PROFESSIONAL OUTLOOK

Again the question arises as to whether there are available dietitians with sufficient training to carry on a program calling for both hospital and clinic training. Apparently there are not, but it is hoped that the student dietitian training course can be extended to provide for additional training in the clinic phase.

Plans have been in the making for some time whereby the student dietitians may earn credit toward a master's degree during their training. Further development of this plan should broaden the dietitian's professional outlook. It should greatly increase her contribution in the treatment of the patient, and it should make her more valuable to the doctor.

REFERENCE

(1) McHenry, K. A. Educational programs in a Veterans Administration hospital. J. Am. Dietet. A. 22: 614, 1946.

ORGANIZATION OF A SCHOOL LUNCHROOM PROGRAM[1]

MARGUERITE MOORE

Director, Tulsa Public Schools Cafeterias

The government, through the many agencies organized during the war, has made the public nutrition-conscious. The good accomplished by these programs must be forwarded through the combined efforts of dietitians, home economists, nutritionists, and all persons engaged in the various branches of food service. The school lunchroom offers an unlimited opportunity to carry on such work. The diet of the growing child is of vast importance not only to the child, but to the school, the community, and the nation. All those in direct contact with students can accomplish much in encouraging good eating habits.

The dietitian knows every phase of feeding, as well as the fundamentals of nutrition, purchasing, food preparation and service, and even administrative work. These qualities, combined with an interest in the development and welfare of children, are requisites for the ideal manager of school lunchrooms. Such a manager is capable of carrying on these educational opportunities.

The lunchroom program throughout the nation has grown so rapidly that it has not always been possible to keep the educational phase of the program abreast of the actual growth.

It is hard to realize, for instance, that the Tulsa Public School Cafeteria System, which today faces the daily task of preparing and serving 22,000 lunches, had its origin in two small home economics rooms and one lunchroom in three widely separated districts of the city. It is equally hard to conceive that the present network of forty completely equipped, efficiently operating cafeterias sprang from a beginning which afforded only basement space and personnel consisting of three home economics teachers.

In 1917, nearly thirty years ago the Child Welfare Board of Tulsa laid the first foundation for the

[1] Presented at the 29th Annual Meeting of the American Dietetic Association on October 16, 1946, Cincinnati.

"Take any card from your recipe files of puddings, cakes, pies, meats, sea food, salads, gelatin or dairy products dishes. Rare indeed is the recipe you pick that doesn't lend itself to the use of pineapple in some form with novel and delicious results.

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Patricia Collier
Dole Home Economist

system when it established a soup kitchen for the underprivileged children of one district.

In the early lunchrooms the home economics teacher divided her time between actual class work and supervising the preparation of lunch. She planned her menus, did her own purchasing, and quite often even her own delivering. There were times when she and the class took over the entire burden of preparing lunch. Added to the teacher's duties as general overseer, purchasing agent, dietitian, and sometimes dishwasher, was also the task of handling the daily receipts. She generally followed the American housewife's quaint habit of hiding her money in a sugar bowl or in the bean sack; it was either that or the almost impossible task of dashing to the bank during school hours.

These teacher-managers had to struggle for well-balanced nutritious meals. They were handicapped by poor and inadequate equipment and most of the time by inefficient help. A typical menu might be adequate in caloric values, but still lack variety. The teacher-manager was primarily guided by what she had been able to purchase before or after school. For six years the lunchrooms engaged in a daily scramble for existence.

In 1924, however, a more systematic procedure was adopted. A new department, known as the Cafeteria Department, completely independent of the Home Economics Department, was founded. A director was appointed, and a central office was established and charged with the administration of the entire project. A business-like system of bookkeeping was set up to account for all income and disbursement. This was the foundation of the well-organized Tulsa Public Schools Cafeteria System of today. The individual units increased in number as the needs increased, and before long the growth of the cafeterias equaled that of the schools. When the Tulsa system established the junior high schools, each was provided with a well-planned, thoroughly equipped cafeteria. At present, all but three small elementary schools have cafeterias.

In 1931, the Cafeteria Director began to plan identical menus for all elementary schools, thus establishing a standard which assured a well-balanced noonday meal at each school. Menus for the junior and senior high schools today are also based on this standard menu, although more flexibility is permitted to fill the varying needs and preferences of older students. Each month a different group of cafeteria managers meets with the director, makes the menus, and discusses current problems and new ideas.

A general meeting of the managers is held each year at the opening of school, and throughout the year special meetings which have proved their worth are called. One meeting which stimulated pride even in the task of dishwashing dealt with the making and care of china. At another session, a demonstration in meat cookery was given for the cafeteria employees.

In 1935, a file of standardized recipes was made for use throughout the entire system. Cafeteria workers in night school classes tested and experimented with these recipes. Then, as now, there was a determination to maintain the highest standards in our school lunch program. The recipes are constantly being improved and the file enlarged. It is hoped that a test kitchen can be established soon to continue this work.

Efficient management can be of little value without efficient purchasing. In 1930, central purchasing was established and a buyer was added to the central office staff. The school cafeterias are the heaviest food buyers in the city, and this central buying power is used to the greatest advantage. The purchasing is done on the basis of competitive bids submitted for the entire school year when products are available.

The buyer notifies salesmen that he is interested in certain items, such as spinach, green beans, or apricots. Each salesman submits his product. All such foods are labeled with numbers, before the cans are cut. The liquid is measured and the solid is weighed and checked as to color, uniformity of size, texture, and finally taste; then the prices are compared. This method has proved satisfactory, especially during the last few years when many new brands have appeared on the market. The salesmen are all welcome to examine the products and all feel that they have had a fair chance to compete for the business. The chef of one of the exclusive clubs once remarked to a Tulsa business man that if the schools used a certain brand that recommendation was enough for him.

Once a week the cafeteria manager sends a grocery order directly to the central office. All small quantity items as well as contract items are delivered from the central storeroom. Meat, milk, ice cream, fruits, and vegetables are delivered directly by the companies who hold the contracts for the individual schools.

The cafeteria manager checks all merchandise received, then signs the invoice and mails it to the central office where all bookkeeping is completed. The books are audited monthly by the chief accountant of the Board of Education and annually by an outside accounting firm.

After the standardized menus and recipes were well established, the plate-lunch idea was introduced and promoted throughout the cafeteria system.

This plate lunch consists of a choice between two meat dishes or meat-substitutes, a choice between two vegetables or a salad, a whole wheat bread and butter sandwich, and ½ pt. of milk. For example, on one lunch students could choose for their entrée between meat pie and creamed eggs, with a further choice between spinach and diced fruit salad.

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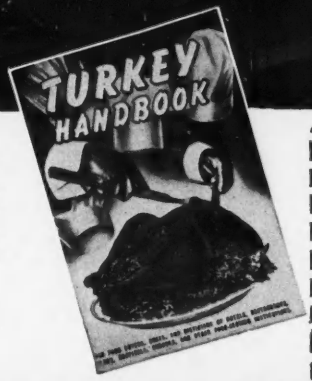
This claim has been made for some time by users of the new meat-type turkeys which are proving so popular in almost every kind of eating establishment: restaurants, hotels, clubs, dining cars, lunch counters, drive-in stands, hospitals, school cafeterias. Now the claim is even more significant. As this is written, large tom meat-type turkeys are lower in price than at any time in years, while quantity and quality are better.

Many institutions are taking full advantage of this situation by creating attractive turkey dishes in great variety, and by featuring turkey every day in the year.

No longer is the popularity of turkey limited to the Thanksgiving and Christmas season, nor to traditional roast turkey. One large Chicago restaurant serves turkey in 33 different and delightful ways. . . to utilize the complete bird and to keep its patrons coming back for more. A large New York hotel reports the use of more than one million pounds of turkey annually. Many users have increased their use of turkey several fold since the begining of the war. And yet turkey is still an uncommon meat . . . comparatively speaking. Total consumption is less than three per cent of the meat total.

Thousands of pounds of turkey are served over Woolworth's lunch counters daily. Here is a Woolworth customer being served a hot turkey dinner



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When the cafeteria department was established, much emphasis was placed on the sanitary handling and preparation of foods. Today, before reporting for work all cafeteria employees are required to pass a strict physical examination conducted by the school physician, and the City Health Department periodically makes rigid inspections of each unit. The central office retains the services of a chemist whose duty it is to make analyses of samples of meat, milk, ice cream, bread, and other products. If his examination discloses any deficiency or misrepresentation, he reports this to the buyer who immediately checks with the supplier. This precaution, plus the fact that the best foods available are purchased, insures the high quality of meals.

A bonded employee collects daily receipts from each unit, turns them over to the Treasurer of the Board of Education, who in turn checks and deposits the cash in a single bank account.

The cafeterias in Tulsa have become recognized as a service department with an educational purpose. Although the Board of Education builds and equips new cafeterias, their operation and maintenance depend entirely on income. There is no "profit motive" in the operation. However, since some small units never can be self-supporting, the larger ones must make enough "profit" to carry the expense of the others. It is only by virtue of the central system that it is possible for all to have the same equipment and high standards in food and service.

Constant study is given to the improvement of the cafeterias. Every effort is being made to equip all units with modern, efficient equipment that requires a minimum of repair. During the summer of 1946 acoustical installations were made in four of our largest lunchrooms, and the benefits are almost unbelievable. These lunchrooms now have a quiet, soothing atmosphere that is enjoyed by cafeteria workers, students, and teachers alike. In the newer schools the cafeterias have been well planned and well equipped to care for the needs of the students. A number of the older units have been remodeled and equipped and this work is continuing. Careful consideration is given to the selection of equipment and how it will improve food preparation and service. Electric dishwashers, mixers, electric refrigerators, well-spaced tables and sinks, as well as bake ovens, ranges, steamers, peelers, and slicers make our kitchens efficient. Every lunchroom has steam tables, electric refrigerator cabinets, and a section for milk and ice cream in its counter.

Special menus and appropriate decorations are planned for holidays, such as Hallowe'en, Thanksgiving, Christmas, Washington's Birthday, St. Patrick's Day, and Easter. An added value to such a program is the benefit to managers and workers. They have become more interested in their tasks and in turn more interested in their youthful customers. Often the lower grades or the art classes assist in decorating the dining room, thus creating a feeling that the lunchroom is definitely a part of their school activities.

To facilitate home menu planning and to avoid duplication of the children's school lunch at home, the menus are printed weekly, free of charge, in one of the local newspapers. This added convenience enables mothers to help small children choose their lunch before they leave for school.

About fourteen years ago the socialized lunchroom program was pioneered, thus incorporating the lunch hour into the school curriculum, and a closer cooperation between principals, teachers, and cafeteria managers became evident. The lunch period has become a vital part of the educational program and is an excellent laboratory for table manners, courtesy, and good nutritional habits. This is perhaps the greatest value of the school lunch program aside from the obvious one of seeing that children are well-fed.

Increasing student interest in nutrition was recently shown in a junior high school when groups wrote and presented plays on food habits. In another school the journalism classes wrote some interesting articles on lunchroom behavior for their school paper. Home making classes aroused much interest and considerable discussion with a project advocating what was termed a "four-star-lunch," which satisfied the seven basic food needs.

Last year the Tulsa Dairy Council and Junior Red Cross dietitians carried on extensive cooperative nutrition programs. They distributed over 27,000 pieces of educational literature prepared by outstanding nutrition authorities. A health educational program consisting of chalk talks and movies was given in sixteen schools and to seven P.T.A. groups. Another such program is planned for this year, with the hope of visiting all the schools. Such assistance is most helpful and appreciated as the cafeteria department staff is too limited to carry on such a program.

In Tulsa, institution management or home economics graduates operate seven junior and senior high school cafeterias and hold regular teacher contracts. This standard has been difficult to maintain, as it is almost impossible to employ sufficient personnel with good training and experience.

OPPORTUNITIES FOR NUTRITION EDUCATION IN THE SCHOOL LUNCHROOM[1]

FLORENCE I. SCOULAR, PH.D.

Dean of Home Economics, North Texas State College, Denton

There is no need to convince dietitians that the school lunchroom is not only an ideal place for the teaching of nutrition, but that there are many opportunities for such teaching. This discussion

[1] Presented at the 29th Annual Meeting of the American Dietetic Association on October 16, 1946, in Cincinnati.

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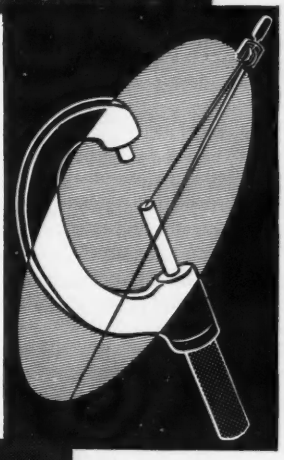

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will deal with some of our experiences at North Texas State College in teaching nutrition through the school lunch program—a program which begins with the nursery school and extends through our college dormitories. This program also serves to train our vocational homemaking graduates to assume the responsibility of the lunchroom.

To activate the program, a Demonstration School Lunchroom is operated. It is only average; it is housed in a small building which was not originally planned for such purposes. About half of the equipment is the type found in a large home, while the remainder is of the institutional type. The children must be fed in shifts and over a rather short period. The two cooks have been with us since the time of the W.P.A. and are above average both in cooperation and in intelligence. The supervisor, who has had institutional training as well as home economics education work, directs our vocational majors during their period of participation in the lunchroom.

All of the practice teachers in the Demonstration School are also required to have some experience in the lunchroom. It begins with their participation at the noon hour with their particular grades or classes. In order to make this more meaningful, all elementary majors, beginning in September, 1946, are required to have a course in elementary nutrition for their degree in education. The fullest contribution will naturally be made when the present freshmen are practice teaching in 1949. In other words, the breadth of opportunities for nutrition teaching in connection with a lunchroom program is just beginning to be realized in our institution.

The home economics student's participation begins with a series of six lessons devoted to the most frequently-occurring problems. Topics considered include menu making, ordering, use of surplus commodities, storage, accounts, health laws and regulations, and supervision of personnel. Each student then spends some time observing the children in the lunchroom at different lunch periods before assuming any of the specified duties. All of the menus must be planned to furnish a minimum of one third to one half of the child's daily needs. To aid in calculating each food substance each day for each group of children, forms are given to the students, together with some cost estimates. Records are made on these forms of each day's food, including meat or meat-substitute, vegetable, salad, bread, and dessert. Some desserts are also served as the breadstuff, such as gingerbread and apricot muffins. Milk is served to every child every meal, as well as fortified margarine.

This is the fifth year for this program, and we hope that by another year one of our student's majoring in foods and nutrition will be able to assume the technical direction, thus relieving the college staff member for the coordination of the lunchroom nutrition program with both the elementary education majors and the homemaking majors. Although this is a non-institutional set-up, a trained foods and nutrition major can make use of the same opportunities for nutrition education. To point up these opportunities which are open both to trained and non-trained lunchroom supervisors, some of the results, methods, and experiences are listed below:

(a) A clean plate has been a continuous ideal in teaching the children to eat all kinds of vegetables and food combinations. By encouraging the children to form the habit of eating everything placed before them, it is felt that the number of foods they like can be increased. Most children like the foods which they actually taste, and most dislikes are proclaimed because of unfamiliarity. For instance, many say that they do not like liver, but when it is attractively prepared and served and the child eats it, he likes it. Plate waste as the result of serving liver is no greater than at other times. One cafeteria manager has reported that her students would not eat tongue, but when it was served as beef, they ate it and commented on how good it was.

(b) The children are given an opportunity to plan their own menus. Even the pupils of the third grade, with their teacher's help, have planned some of the lunches. Lists of foods have been made with groupings as to meats and meat-substitutes, vegetables, fruits, and desserts. Some foods carry two stars, some one star, and some are not starred. The two-star foods are relatively expensive and only one can be used in a meal; all the other foods for that meal must be non-starred, the latter being inexpensive. When one-star foods are used, two may be included for they are less expensive than the two-star foods. With these lists and the weekly menu form, it is relatively simple to select good menus to be prepared and served in the school lunchroom. This gives even the very young children experience in planning a menu. In this way, also, they may be led to plan a meal around a food which has not been well received before, and they will eat it when it is a part of the menu which they have planned. The different grades and classes are given turns in planning and having their meals served.

(c) One group (third grade) offered to paint a mural on the wall when the lunchroom was redecorated, all of which contributed to a feeling of pride and ownership in the lunchroom. This, it is found, carries over to their participation in cleaning their plates and eating the foods placed before them without complaints.

(d) The students' participation and cooperation has also improved the teacher relationship in the lunchroom. We find that many of the teachers have improved their eating habits in order to set good examples for their students.

(e) Through menu-making and good food prepara-

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tion, the children are learning food standards as well as becoming accustomed to eating their fair share of a food. We try to show that nutritious foods do not need to be unattractive, unpalatable, and commonly disliked, and our cooks have cooperated in improving food standards as well as the attractiveness of the service.

In connection with improving the quality of the food served, the cooks were observed as they prepared the food. It was found that many foods were prepared early in the morning, although they were not to be served until noon. The cooks were not familiar with a method of staggered cooking and cooking in small quantities and more frequently.

To show the cooks the effects of this method of cooking, a graduate student collected samples of food at different times and analyzed it for ascorbic acid. This was done on the assumption that if this vitamin was well retained, the other foodstuffs would also be retained. The cooks showed considerable interest in the procedure and asked for the results. When they were available, the cooks accepted the findings with good feeling. Since that study three years ago (the same cooks are still with us), we frequently hear one cook say to the other: "I can't start that yet; it should be cooked just before we begin serving," or "The fresh vegetable salad shouldn't stand after it's prepared. You'd better wait to shred that cabbage." Our vegetables are now cooked for a shorter time in small amounts, instead of all at one time, in order to avoid holding through the serving period.

To compare the plate lunch such as we serve with the usual selection made by similar age groups, two schools' lunches were studied—ours and that in a cafeteria in a near-by city school. A sixty-day survey of the noon lunch foods was made in the city school cafeteria from November 2, 1943, to March 29, 1944. Checkers were stationed near the cashier so that the foods on each tray could be tallied on a chart. These daily charts formed the basis for comparison of menus selected most frequently and indicated food preferences. They also served as a record of the variety of food items served each day.

In this school, there was no educational program conducted in connection with the lunchroom service, nor was the menu posted in advance. For this reason, it was thought that this provided an excellent opportunity to learn the school child's food preferences without outside influence. Consequently, food lists were checked to find the number of servings of each food during the sixty days, together with the number of times it appeared on the menu. Potatoes, which were served each day, were the most popular, although this was not true of the other vegetables which appeared most frequently on the counter. No doubt habit played a major role in the case of potatoes. The next foods, in the order of their popularity, were: ice cream, candy, orangeade, milk, and cookies. All except ice cream were on the menu each of the sixty days. Ice cream was served on only forty-seven days; yet it was the most popular, exceeding even candy.

It was heartening to find that milk ran rather close to orangeade in popularity. It must be pointed out, however, that it was the elementary group which most consistently selected milk, rather than the junior-senior students. Apparently, the younger children are closer to the home influence, and group approval, as well, is accorded the milk drinker at that age.

In studying this difference between the food selected by the elementary and junior-senior students, it was found that the elementary group made consistently better selections. The nutritive values of the ninety-eight elementary school children's lunches and the sixty-one junior-senior pupils' lunches were calculated for total calories, protein, calcium, iron, vitamin A, thiamine, riboflavin, and ascorbic acid. These results were compared with one third of the National Research Council's Recommended Dietary Allowances for these same age groups and were found to be very low, although the elementary group consumed foods contributing more than twice as much of the nutrients as those consumed by the junior-senior group. The elementary group even exceeded that of the junior-senior boys' selection.

Without an effective educational program in nutrition, it is doubtful whether a child left to his own selection in a cafeteria will choose those foods which he needs to complete his day's nutritional needs. The plate lunch removes that responsibility from the student, although it puts an extra burden on the cafeteria manager. If she is an untrained person, she may not be able to assume this task satisfactorily, although it is questionable whether the resulting menu could be worse than that selected by the unguided child.

It is not enough to have good food prepared and served in a school cafeteria. The students must buy and eat it. This requires an educational program which includes the concerted efforts of both the parents and the teachers, and it may call for an adult nutrition education program conducted through the P.T.A. or the school. All of the teachers should be better trained to help sponsor the lunchroom's program. Unfortunately, however, many teachers must be "sold" on the value of the program before they can be trained to guide and teach the children. It is our business, as trained nutritionists, to "sell" this idea and to help in the direction of the school lunchroom nutrition program. The opportunities are there. We cannot afford to disregard them if we are sincerely interested in the nutritional welfare of our children.

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Book Reviews

Foods: Their Values and Management. By Henry C. Sherman. New York: Columbia University Press, 1946. Cloth. Pp. 221. Price $3.25.

We must never lose sight of the fact that all nutrition knowledge becomes of real value only when it is translated into terms of foods. It is *food* that the family eats. The differences in food values, the management of food in preparation so as to retain the greatest nutritive value, and the production, distribution, and cost of food are the practical problems which concern the housewife, the dietitian, and the nutritionist.

Dr. Sherman's book deals with just these problems and is, therefore, a most welcome companion volume to his earlier publication, *The Science of Nutrition.*

There is a detailed discussion of the ten major food groups with a chapter devoted to each. In addition, the over-all national and international aspects are given in the introductory chapter on "Modern Views of Food Supply" and in a final chapter on "Food Adjustment Problems."

An excellent supporting list of references is a guide to wider reading, and the comprehensive index adds to the book's value as a ready reference.

Any book by Dr. Sherman commands attention. His experience in research, his knowledge of nutrition, and his understanding of world food problems combine to make this book of practical value to lay readers as well as to all professional workers concerned with the health and well being of citizens. The medical profession, dietitians, nutritionists, food economists, and workers in welfare agencies will find it an up-to-date, reliable reference and guide.—*E. Neige Todhunter, University of Alabama, Tuscaloosa.*

Health Education in Rural Schools and Communities. By Nina B. Lamkin. New York: A. S. Barnes and Company, 1946. Cloth. Pp. 209. Price $2.50.

There is real need for just such a book as the author has presented. For too long, health and health teaching has been theory rather than practice. "There are opportunities throughout the twenty-four hours of the day to use your knowledge in finding the health problems in your schools, home, and communities and to work out ways and means for their solution.

"Health education is a continuing and well-balanced educational program which has for its goal the improvement of human living. It is an integral part of the school curriculum and of the day-by-day life in any community." These sentences illustrate the philosphy and sound practical approach of the author.

The book is well organized in five parts. Part I deals with "Health Problems in Rural Areas" and how to find them. Part II covers "Helping Children in Rural Areas to Understand and Practice Healthful Living" and provides a series of suggested units. Part III is on "Helping Children to Understand Life—The Rural High School—Community Cooperation on Community Problems." Part IV handles the subject of "The Teacher's Health and Preparation" and covers both pre-service and in-service education. Part V consists of "Additional Helps."

This is not a subject matter text; it is for use only by those who are trained for work in health education.

Nutrition and the school lunch program are well treated in relation to the total health of the individual. However, it would be preferable to place the emphasis on an *adequate* lunch rather than on a *hot* school lunch.

To this reviewer, it would also seem desirable in the discussion of the teacher's health and preparation to do more than make the statement, "The teacher needs to understand nutrition as it relates to the school lunch and to recommend the sending out of loan packets including material on nutrition. Today it is being more fully recognized that every teacher, and particularly the health educator, needs some definite training in nutrition as it relates to personal health and as part of her pre-service education." In order to carry out the excellent practical suggestions of the author, sound nutrition training for the teacher is essential or misinformation and confusion will result.

While this book is directed primarily to rural teachers, the general principles and suggested problems and approaches can be applied anywhere, and this book merits wider acceptance and use than its title implies.—*E. Neige Todhunter, University of Alabama, Tuscaloosa.*

Establishing and Operating a Restaurant. By Mary deGarmo Bryan, Alberta M. Macfarlane, and E. R. Hawkins, under the direction of the U. S. Department of Commerce and in cooperation with members of the National Restaurant Association. Washington: Superintendent of Documents, 1946. Paper. Pp. 287. Price 45¢.

This is No. 39 of the Industrial (Small Business) Series and was originally prepared as an educational manual for the War Department. It is now available for general distribution.

It is complete in its scope and contains a wealth of technical information, much of it obtained from the practical experience of successful operators. The information is clearly and concisely presented, making it a manual of special help to the inexperienced operator wishing to go into business for himself, although even the oldest operator will find many new and helpful suggestions.

The subject is completely covered, beginning with the selection of a location and the organization attendant on getting into the business, carrying on through furnishings and equipment, laws and regulations, personnel, and operating problems such as menu planning, food purchasing, methods of cooking, sanitation, merchandising, and various kinds of records. There are many excellent tables and lists. The book could well serve not only as a manual for the operator but as a text book for college courses in hotel and restaurant management and in institutional administration.—*Lila Hainer, Sheboygan, Wisconsin.*

You Can Cook If You Can Read. By Muriel and Cortland Fitzsimmons. New York: The Viking Press, 1946. Cloth. Pp. 364. Price $2.50.

This cook book is supposed to show a "wonderful new way to better cooking." It is supposed to be "an easy

New Food Tips for Dietitians

QUANTITY RECIPES - MENU HELPS

PEACH CRISP DESSERT

Crunchy cereal and sun-sweetened California peaches make this simple pudding a popular item! 48 servings

	Weight	Measure
Sliced canned cling peaches		5 quarts
Brown sugar	2 pounds	1 quart packed
Sifted all-purpose flour	8 ounces	1 pint
Finely crushed corn flakes	8 ounces	1 quart
Nutmeg		2 teaspoons
Salt		2 teaspoons
Butter or margarine	1 pound	2 cups

Drain peaches before measuring; arrange slices in 2 shallow greased pans (approximately 10 x 18 inches). Blend together dry ingredients. Cut in butter until mixture is texture of coarse corn meal. Sprinkle over peaches. Bake in moderately hot oven (375° F.) 25 minutes. Serve warm or cold with cream.

How plump, sun-sweetened California Canned Cling Peaches help hold your cooking costs down

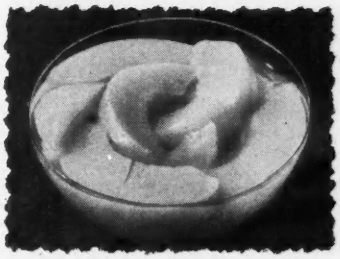
Penny-saver peach tarts: Butter a slice of fresh bread and press into greased muffin tin to form cup. Place peach half, cup side down, on bread. Bake 10 minutes, or until fruit is heated through. Serve warm with sauce made of peach syrup, slightly thickened and sweetened; add lemon rind for flavor.

Cake saver: Thicken canned fruit cocktail with cornstarch. Serve warm over pound cake or simple pudding.

Sugarless ginger-peach pudding: Place peach half, cup side up, in greased custard cup. Over it pour your favorite gingerbread batter. Bake in moderate oven (350° F.) 40 minutes. Serve with peach on top. Decorate with whipped cream.

Meat loaf money maker: Brush peach halves with butter or margarine. Spread with zippy catsup. Broil until peaches are heated through and top bubbly. Good with Salisbury.

Sunshine eggnog: Mashed canned peaches give milk drinks a new mellow-rich flavor.



California Cling Peaches ripen lazily in sun-drenched valleys. They're sweet, tender, golden yellow. America's favorite easy dessert right from the can. Thrifty, convenient, popular in salads, baking, garnishes, too! Make sure the label says "clings"!

They're wonderful so many ways!

California Cling Peaches

In tin or glass

Canned Halves · Canned Slices · Canned Fruit Cocktail

short-cut for the beginner and a revelation to the experienced." Unfortunately, the book does not live up to its purpose. Several dietitions, who were asked for their opinion of the book, agreed that it was repetitious, monotonous, and dull.

It opens with a chapter on preparing to be a cook. A list of definitions and miscellaneous hints follows. Then the necessary measurements and equivalents which are to be found in all standard cook books are given. Various types of cooking equipment are discussed—from coal ranges to outside fires, and a list of small utensils and tools is included as well as the basic supplies to be kept on hand.

When one finally comes to the recipes, there is a feeling that they could have been written more clearly and concisely if the beginner is to find them easy to read and follow. It is here that the repetition occurs. The definitions and miscellaneous hints already given are again included in every recipe where they are applicable. It is claimed that constant repetition is the only way in which people learn, but here it seems to clutter up the recipe and add to the general confusion.

If there were less of the bright chatty informal manner in the writing of instructions, some space might have been gained so that each recipe would stand out a little more clearly and would have been a little less confusing to the beginner. The typesetter or designer, also, did little to relieve the monotony of the book, for nothing stands out on the printed page.

The recipes seem to be accurate enough as far as proportions are concerned, but the book is not one which is apt to be included in the group of old "stand-bys" which one keeps on hand for ready reference.—*Katherine E. Louser, Norristown State Hospital, Norristown, Pennsylvania.*

Conference Course Lectures on the Modernization of Food Service Facilities and Operations in the Restaurant Industry, Midyear 1946. Chicago: National Restaurant Association, 1946. Paper, spiral-bound. Mimeo. Price $2.75.

This is a compilation of the lectures given at the Conference on Restaurant Operation held last July by the School of Business of the University of Chicago in cooperation with the National Restaurant Association. Although the lectures made available in this book are of special interest to restaurant people, they should prove stimulating and helpful to other food administrators as well.

In it Alberta M. Macfarlane presents excellent information on what to consider in selecting the proper location for a restaurant in relation to the rent, competition, and neighborhood. Nathaniel A. Owings discusses fully the restaurant exterior, while John W. Root presents ideas on the significance of appearance and decoration in establishing restaurant atmosphere. J. W. Thomson vividly pictures the effect of color and harmony in relation to food service and atmosphere. Interesting presentations are made on space allocation and layout for operating functions, work organizations, and flow of work.

Carlton Lawler's discussion on dishwashing is illustrated with sketches of working units. I. A. Arnoff gives a brief forecast on the possible delivery time of kitchen equipment.

These lectures are stimulating and new ideas which are applicable to everyday work in an institution or hospital kitchen are gained by the reader.—*Clarice Gullickson, Veterans Administration, Washington, D. C.*

Howell's Textbook of Physiology. 15th Ed. Edited by John F. Fulton, M.D. Philadelphia: W. B. Saunders Company, 1946. Cloth. Pp. 1304. Price $8.

Comprehensive revisions have been made in this standard text, now edited by Dr. Fulton, Sterling Professor of Physiology of the Yale University School of Medicine. The revision was done in collaboration with ten outstanding workers and twenty-four contributors. The section on water metabolism and the kidney have been entirely rewritten to bring it in line with current teachings concerning renal clearance. The section on gastrointestinal physiology follows the outline of previous editions, but new work in the field has been incorporated. The section on basal metabolism has been reorganized with the addition of recent disclosures on the part played by the endocrines and the central nervous system in the integration of metabolic processes.

Army Announcements Concerning Personnel

The following Medical Department Dietitians were promoted during February, 1947.

First Lieutenant to Captain

Berger, Florence M., R-441
Breazeale, Mary, R-84
Thomasson, Helen N., R-332

Second Lieutenant to First Lieutenant

Burton, Carolyn G., R-2354
Carr, Margery W., R-2391
Costley, Mary L., R-2362
Dolenc, Emily A., R-2375
Easton, Penelope S., R-2377
Holke, Mary B., R-2388
Huse, Christina M., R-2294
Lagerstrom, Alice E., R-2331
Malone, Ann, R-2383
McCormack, Marian L., R-2398
Meyer, Nancy L., R-2397
Mullady, Jane M., R-2323
Murdick, Joyce, R-2355
Murphy, Elizabeth, R-2365
Obuhanych, Sophia N., R-2401
Reed, Jessie A., R-2334
Reed, Willa A., R-2333
Stanford, Gwendolyn J., R-2320
Stiles, Louise L., R-2330
Thibeault, Leola E., R-1395
Tope, Mary A., R-2372
Trocinsky, Frances J., R-2364

Listed below are the dietitians who have been separated from service.

First Lieutenants

Ball, Elgevia A., R-982, 1612—10th St., N.W., Washington, D. C.
Bey, Florence L., R-271, 2240 Rowley, Madison, Wis.
Casey, Mary C., R-2242, 290 High St., Somersworth, N. H.
Hopkins, Edith E., R-2222, 2151—14th St., Troy, N. Y.
Hughes, Lucinda, E., R-142, 846 Madison, Denver, Colo.
Murphy, Marjorie M., R-2247, 710—13th Ave., S.E., Minneapolis, Minn.
Washburn, Barbara J., R-2265, 1050—42nd St., Sacramento, Calif.

Second Lieutenants

Cohill, Ruth B., R-2227, Cohill Manor, Hancock, Md.
Dyer, Dorismae, R-2447, 71 Court St., Plymouth, Mass.
Titus, June, R-2250, 300 W. 6th St., Marysville, Ohio
Ullman, Phyllis M., R-2235, 218 Erkenbrecker, Cincinnati, Ohio

First Lt. Ethel D. Denio, R-1021, has been recalled to active duty.

The recall to active duty of 1st Lt. Loraine W. Perteit, R-2066, previously reported, has been revoked.

Rich in thiamine

"promotes the recovery of appetite in a more prompt and specific way than does any other known nutrient."

—Sherman[1]

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CEREVIM with its high thiamine content is especially desirable in the pre-school years when faulty eating habits and anorexia often appear. The child who toys with his food or eats only a few foods may actually develop a sub-clinical thiamine deficiency, leading to still further loss of appetite.

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A bowl of CEREVIM and milk supplies 0.71 mg. thiamine

1 oz. CEREVIM . . . 0.6 mg.

8.6 oz. milk . . . . 0.11 mg.

1. H. C. Sherman, Chemistry of Food and Nutrition, 1946
2. National Research Council, Recommended Dietary Allowances, 1945

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Lederle

Current Literature

Contributed by Janette C. Carlsen, Ethel M. Miller, and Janet Engebretsen, Dietary Department, Johns Hopkins Hospital; Lorraine G. Weng and Marian T. Straube, University of Chicago Clinics; and Marjorie M. McKinley, Women's Educational and Industrial Union, Boston.

THE AMERICAN JOURNAL OF DIGESTIVE DISEASES

Vol. 14, January, 1947

*Chronic peptic ulcer in ninety-four diabetics. M. N. Wood.—p. 1.
*Colloidal aluminum hydroxide gel and magnesium hydroxide in the management of peptic ulcer. I. R. Jankelson.—p. 11.

Chronic Peptic Ulcer in Diabetics. In each of the ninety-four cases presented, the treatment was primarily directed toward management of the ulcer and the control of hyperglycemia and glycosuria with insulin. In the majority of the patients, the diabetes was mild, but even when it was severe, the same management was satisfactory. It was necessary to provide a well balanced diet of carbohydrate, fat, and protein suitable to the diabetic state, and this could always be managed for any stage of ulcer. Additional vitamins should supplement the diet. Each diet and insulin order should be calculated for the individual. No form diets should be used.

The Management of Peptic Ulcer. Colloidal aluminum hydroxide gel and magnesium hydroxide combination is an effective, stable buffer which acts in the stomach for several hours. With this combination, ulcer pain and heart burn may be controlled with smaller and less frequent doses than are required with the colloidal aluminum hydroxide gel alone. Clinically, it can be continued for long periods without danger of an acid rebound, alkalosis, or aggravation of constipation.

AMERICAN JOURNAL OF THE DISEASES OF CHILDREN

Volume 73, January, 1947

*Eczema and essential fatty acids. A. E. Hansen, E. M. Knott, E. Shaperman, and I. McQuarrie.—p. 1.

Eczema and Essential Fatty Acids. Inclusion of fats rich in unsaturated fatty acids was found to benefit eczematous patients even without other forms of therapy. In addition to the higher fat intake, other dietary precautions were taken, such as providing an adequate diet and elimination of all foods to which the patient was sensitive.

THE AMERICAN JOURNAL OF PHYSIOLOGY

Vol. 148, January, 1947

*A comparison of the nutritive value of fats when fed alone or when fed with sucrose or lactose. B. H. Ershoff and H. J. Deuel.—p. 45.
*Thiamine deficiency and the specific dynamic effect of a diet high in carbohydrate. G. C. Ring.—p. 51.
*The intestinal synthesis of niacin and folic acid in the rat. L. J. Teply, W. A. Krehl, and C. A. Elvehjem.—p. 91.
*Pancreatic juice as a rich source of the anti-fatty-liver factor. M. L. Montgomery, C. Entenman, and I. L. Chaikoff.—p. 239.

Nutritive Value of Fats with Sucrose or Lactose. Male and female rats were fed diets containing 70 per cent sugar (lactose or sucrose) and 30 per cent fat (butter fat, margarine fat, corn oil, or cottonseed oil). When lactose was the dietary carbohydrate, survival was significantly longer on rations containing margarine fat or butter fat than on diets containing corn oil or cottonseed oil. With sucrose as the dietary carbohydrate, no significant differences in length of survival were observed. When male and female rats were fed diets consisting of a single fat, length of survival was longest with butter fat as compared with lard, olive oil, corn oil, margarine fat, soybean oil, wheat germ oil, and cotton seed oil.

Effect of a High-Carbohydrate Diet on Thiamine Deficiency. The specific dynamic action in rats of a diet high in carbohydrate and containing adequate thiamine is about twice as large as that of a similar diet without thiamine. When 1 mg. of thiamine was added to 1 kg. of the deficient diet, a smaller specific dynamic action was produced than with 2 or more mg. The thiamine-deficient rats at the time studied showed no measurable decrease in ability to use carbohydrate as judged from respiratory quotients.

Intestinal Synthesis of Niacin and Folic Acid in the Rat. The ceca of rats that had been on various diets with and without 2 per cent phthalylsulfathiazole for one and two weeks were analyzed for niacin and folic acid. Dextrin caused the greatest synthesis of both niacin and folic acid. In general, 2 per cent phthalylsulfathiazole produced a marked decrease in the concentration of niacin in the cecal contents, but the ceca increased in size so that the total amount remained about the same. The folic acid content was greatly decreased even on a total basis. Excess niacin increased the synthesis of folic acid, and excess folic acid increased the synthesis of niacin. These effects were prevented by feeding 2 per cent phthalylsulfathiazole. Addition of lactose or milk powder to the basal ration increased the synthesis of both niacin and folic acid. When phthalylsulfathiazole was fed, this increase did not occur. On "synthetic" milk diets, butter fat caused more vitamin synthesis than did corn oil.

Pancreatic Juice as a Source of Anti-Fatty-Liver Factor. Pancreatic juice of the dog contains a factor highly active in the prevention of fatty livers in completely depancreatized dogs maintained with insulin. The daily ingestion of as little as 10 cc. was sufficient to keep the livers of such dogs normal for as long as five months. Ingested pancreatic juice raises the concentration of plasma choline in the completely depancreatized dog maintained with insulin. It is suggested that this factor in pancreatic juice is identical with that contained in raw pancreas.

ANNALS OF INTERNAL MEDICINE

Volume 26, January, 1947

*Late residuals in presumably cured acute infectious hepatitis. G. Klatskin and E. M. Rappaport.—p. 13.

It's a happy breakfast order!

this delicious dish
of wholesome whole wheat

Glad grins greet breakfast when Nabisco Shredded Wheat is included in patients' diets! These crunchy, golden-good biscuits have the zesty flavor of sun-ripened whole wheat . . . and all its natural nutrition. Nabisco Shredded Wheat is just as nourishing as "cooked" cereal—and the one breakfast food that can be served hot or cold! Serve the original Niagara Falls product often—it's a practice patients applaud!

Delicious, ready to serve...
yet as nourishing as a hot cereal

*Comparison of the clinical use of protamine zinc insulin and g'obin insulin in equal doses.—J. T. Roberts and W. M. Yates.—p. 41.

Acute Infectious Hepatitis. Little attention has been paid to residuals and relapses of this disease while much has been reported on etiology, epidemiology, treatment, and pathology. This study was made to determine the incidence of residuals, to evaluate the factors that might have been important in their occurrence, and to assess their clinical significance. Two hundred and seventeen patients with a clear-cut history of hepatitis and jaundice were surveyed; the time of onset of the disease and when the survey was made varied from two months to twenty-seven years. Over half of the patients who were considered fully recovered from the disease had residuals evidenced by symptoms, hepatomegaly, or impaired liver function. Almost all of the patients who had recurrent attacks suffered upper right quadrant pain and showed fat intolerance. There seemed no evidence to indicate progress from late residuals to cirrhosis in any case.

Protamine vs. Globin Insulin. Of ninety-seven patients studied, sixty-five were controlled better with globin insulin, twenty-five with protamine, and seven equally well with either of the two forms. During the course of the study, care was taken to make certain that changes in diet, exercise, infection, healing fractures, hepatic or other disease did not distort the comparison. It can be concluded that globin insulin is safe; it controls the blood sugar curve and glycosuria in a more nearly normal way; it is prepared without glycerin which makes it free of allergic factors; and it tends to produce a mid-afternoon hypoglycemia which is preferable to the nocturnal type.

ARCHIVES OF INTERNAL MEDICINE

Volume 78, December, 1946

*Behavior and psychologic problems of young diabetic patients: a ten- to twenty-year survey. A. E. Fisher, H. Dolger, J. C. Loeb, and B. Gordon.—p. 711.

Psychologic Problems of Young Diabetics. A group of forty-three young diabetics was studied for a period of ten to twenty years; all children were twelve years of age or younger at the age of onset of disease. Almost all came from middle-class or poor families where the financial burden of caring for a chronic disease such as diabetes was great. Young children accepted and adjusted more easily to the disease than did the older group. Problems disconcerting to the diabetic child were found at home, at school, and at play; certain adjustments were necessary to make the child feel that he was not different or an outsider or not wanted. Results of intelligence tests administered to the diabetic patients showed little variation from the normal. In conclusion, it can be stated that diabetes may produce certain psychologic problems resulting in abnormal behavior during childhood, adolescence, and adult life.

BRITISH MEDICAL JOURNAL

No. 4487, January 4, 1947

*Dietetic factors in liver disease. Part I. L. J. Witts.—p. 1.

No. 4488, January 11, 1947

*Dietetic factors in liver disease. Part II. L. J. Witts.—p. 45.

Dietary Factors in Liver Disease. The therapeutic problem in infectious hepatitis is the long period of disability. Various experiments have been carried out with diets and dietary principles, but no specific effect on the disease has been discovered. There is a general impression that strict rest is more important than strict diet. All that has been done is to aggravate symptoms by unnecessary dietetic restriction. The incidence of juvenile cirrhosis and primary carcinoma of the liver may well become regarded as indices of nutrition.

THE CANADIAN MEDICAL ASSOCIATION JOURNAL

Vol. 56, January, 1947

*Nutrition in surgery. H. R. Robertson and D. W. Small.—p. 59.

Nutrition in Surgery. There is a group of patients, who, following operation or injury, are seriously ill and who, if left to their own devices, will become nutritional problems. With these cases, their nutrition should be maintained at as high a level as possible during the days when they cannot or will not take a full diet. When they do resume an ordinary diet they should be provided with and actually consume enough food. At certain periods intravenous feedings and tube feedings are essential to maintain adequate nourishment.

CEREAL CHEMISTRY

Vol. 23, September, 1946

Grain storage studies. IV. Biological and chemical factors involved in the spontaneous heating of soybeans. M. Milner and W. F. Geddes.—p. 449.

The effect of pressure on macaroni discs: Size and number of air bubbles in relation to light transmission. G. S. Smith, R. H. Harris, E. Jesperson, and L. D. Sibbitt.—p. 471.

A micro-milling technique using the Hobart grinder. K. F. Finney and W. T. Yamazaki.—p. 484.

A study of sorghum and sorghum starches. F. E. Horan and M. F. Heider.—p. 492.

Composition of the component parts of the corn kernel. F. R. Earle, J. J. Curtis, J. E. Hubbard.—p. 534.

*Influence of ingredients on thiamine retention and quality in baking powder biscuits. A. L. Briant and M. R. Hutchins.—p. 512.

Vol. 23, November, 1946

*Effect of parboiling on thiamine in rice. M. C. Kik.—p. 529.

Studies of the composition of the wheat kernel. III. Distribution of ash and protein in central and peripheral zones of the whole kernels. V. H. Morris, T. L. Alexander, and E. D. Pascoe.—p. 540.

Photomicrographic studies of wheat starch. II. Amylolytic enzymes and the amylase inhibitor of the developing wheat kernel. R. M. Sandstedt and O. C. Beckord.—p. 548.

Some observations on the visual color of tubular and disc macaroni. L. D. Sibbitt and R. H. Harris.—p. 559.

Note on a semi-micro milling procedure for durum wheat. M. H. Fisher and W. O. S. Meredith.—p. 565.

A micro method for making macaroni. V. G. Martin, G. N. Irvine, and J. Ansel Anderson.—p. 568.

*Effect of gassing rate on loaf volume. H. Miller, J. Edgar, and A. G. O. Whiteside.—p. 579.

Modification of the gas production and gas retention properties of dough by some surface-active, reducing, and oxidizing agents. E. C. Swanson and C. O. Swanson.—p. 590.

Vol. 24, January, 1947

Commercial production and use of mold bran. L. A. Underkofler, G. M. Severson, K. J. Goering, and L. M. Christensen.—p. 1.

Grain storage studies. V. Chemical and microbiological studies on "sick" wheat. M. Milner, C. M. Christensen, and W. T. Geddes.—p. 23.

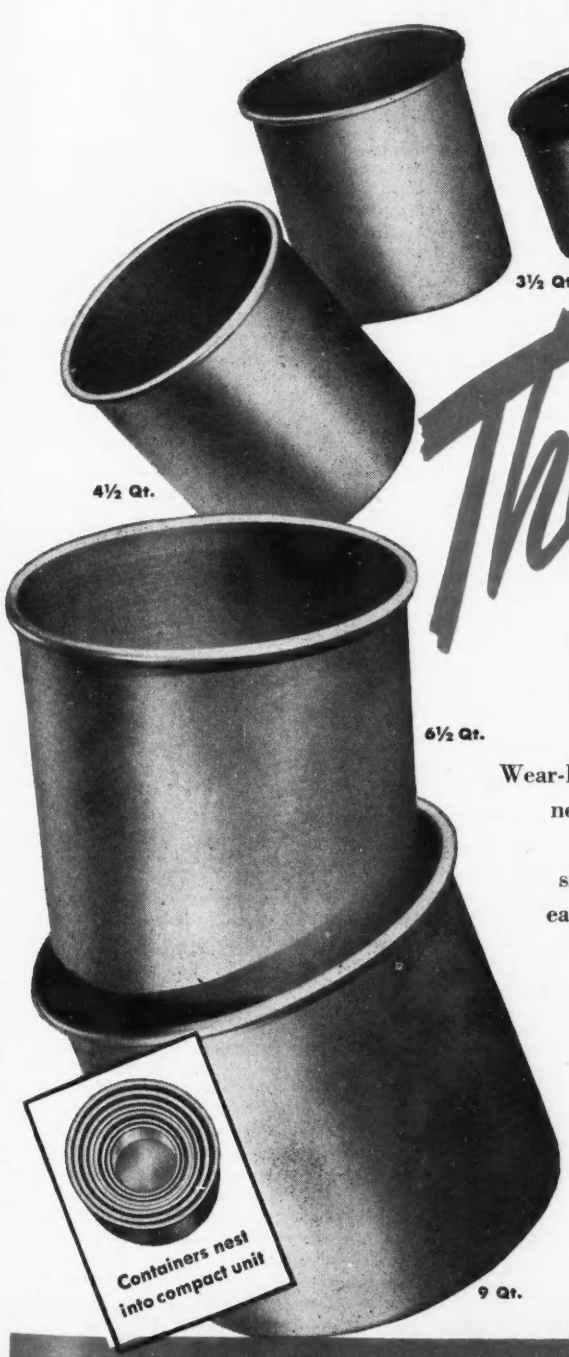
Some characteristics of gliadin and glutenin indicated by dispersion and viscosity. M. A. Barmore.—p. 49.

Kinetics of beta-amylase action in 20% starch pastes at elevated temperatures. W. D. Claus.—p. 59.

Sources of beta-amylase as supplements to barley malts in saccharification and fermentation. S. Schwimmer.—p. 70.

Thiamine Retention in Baking Powder Biscuits. A basic formula was used for the biscuits, and variations were made in liquid and in leavening agent. Biscuits made with fresh milk, evaporated milk, water, and dry whole milk plus water were alike in their thiamine content. The biscuits made with fresh whole milk retained slightly more of their thiamine content than did the others.

7 AIDS TO SANITARY KITCHEN CONDITIONS



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Biscuits made with sodium aluminum sulfate-phosphate baking powder were alike in their thiamine content and retention. Increasing the amount of the baking powder by 50 per cent increased the loss of thiamine during baking. The biscuits made with a tartrate and with a phosphate baking powder lost more thiamine than those made with sodium aluminum sulphate-phosphate baking powders.

Biscuits made with varying proportions of lactic acid, bicarbonate of soda, and baking powder retained less thiamine as the soda was increased. At the lowest level of soda, 84 per cent of the thiamine was retained; at the highest level, only 15 per cent.

Effect of Parboiling on Thiamine in Rice. The results of this study show the effects of simple controlled methods of parboiling of rough rice on the thiamine content of the milled form after approximately the same percentage of the bran has been removed. A total of eighty-eight samples of the same lot of previously cleaned rough rice were soaked in distilled water under varying conditions of duration and temperature and with variations in amounts of steam pressure. These samples of rough rice were parboiled by boiling; boiling and steaming; steaming; soaking and steaming; soaking, boiling, and steaming; according to rice conversion with and without vacuum. The data showed that boiling alone was unsatisfactory. Good results were obtained by all of the other methods.

Effect of Gassing Rate on Loaf Volume. Experimentally milled flours of Canadian hard red spring wheat were used in this study which was undertaken to note the effect of supplementation with sucrose and diastatic malt on the gassing properties of the flour. The gas production for these flours showed wide variations not only in peak rates but in the times when the peaks occurred. The addition of sucrose and diastatic malt to the doughs increased the gassing rates as fermentation was extended to the pan proof period, but the degree of response was independent of the "inherent" rates.

The relationship of gas production and loaf volume was investigated on a composite experimentally milled flour using four different malt-sucrose supplements and five different fermentation times. Small additions of sucrose and diastatic malt gave high loaf volumes with short fermentation times, but larger additions gave uniform loaf volumes over a fermentation period extending from 185 to 265 min. The maintenance of adequate gas production in the pan proof period resulted in high loaf volumes.

GERIATICS

Vol. 1, September-October, 1946

*Diet in older people. W. Johnson.—p. 348.

Diet in Older People. The vegetarians and the meat eaters have demonstrated that the human digestive apparatus can adapt itself to a wide variety of foods. Many older people are greatly benefited when their diet contains an adequate intake of protein. A lack of sufficient teeth to chew properly is a problem as people grow older, and because carbohydrate foods are easily chewed, they frequently occupy too large a place in the dietary.

Older people are likely to become victims of dietary fads and fancies. Expressions such as "I can't eat fish," "I can't drink milk," or "I never could learn to like spinach," are fairly common. The great majority of food fancies are purely imaginary and can be overcome.

Dieting is another fad which may be dangerous. Leanness is preferable to obesity, especially after middle age, but it is important to include the protective foods in a reducing diet. The soundest advice to older people concerning diet is to eat temperately of a balanced diet at regular intervals and under the most pleasant surroundings possible.

HOSPITALS

Vol. 21, January, 1947

*Aseptic technique and procedures in formula rooms. M. Pattani and M. M. Harrington.—p. 72.
*A new formula room made to order. C. P. Wright, Jr.—p. 74.

Aseptic Technique and Procedures in Formula Rooms. A description of the physical plan, equipment used, and personnel employed in preparing formula by aseptic technique at the Harper Hospital, Detroit, is presented. A floor layout is also included in this article.

A New Formula Room Made to Order. The change in responsibility for formula making from the nursing department to the dietary department at United Hospital, Port Chester, N. Y., is discussed. Details of the new formula room, including physical layout, floor plan, equipment, personnel, and procedures are presented.

JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

Vol. 132, December 14, 1946

*Folic acid and sprue. G. Lopez, T. Spies, J. Menendez, and R. Toca.—p. 906.

Vol. 133, January 4, 1947

*Diet low in salt (sodium) in congestive heart failure. E. Wheeler, W. Bridges, and P. White.—p. 16.

Vol. 133, January 18, 1947

*Simplified method for calculating diabetic diets. E. Caso and F. Stare.—p. 169.

Vol. 133, January 25, 1947

*Some basic research needs in nutrition. P. Jeans.—p. 245.
Nitrogen balance. Editorial.—p. 249.
Pasteurization of milk. Editorial.—p. 249.

Vol. 133, February 1, 1947

*Caloric intake and industrial output. Editorial.—p. 322.

Folic Acid and Sprue. In the series of eighteen cases of sprue reported, the administration of synthetic folic acid in daily oral doses as low as 10 mg. resulted in the alleviation of all major symptoms, prompt regeneration of the blood, and a tendency of the gastrointestinal tract to return to normal. All cases selected for this study were suffering from macrocytic anemia, bone marrow with typical erythroblastic arrest seen in pernicious anemia, erythrocyte counts below 2½ million, glossitis, persistently low reticulocyte counts during observation, diarrhea characterized by fatty stools, and had previously been untreated. The patients were admitted to the hospital for preliminary examination and base line determinations and were placed on meat-free diets. In addition, only 1 qt. of milk and one egg were allowed daily. The patients were allowed all other foods as desired. Detailed daily hematological and gastric studies were made, and 24-hr. stool specimens were collected and examined. Diet histories revealed inadequate dietaries in every instance. Following the preliminary determinations, folic acid was administered, at first in water suspension and later in tablet form. The anti-anemic effect of folic acid was apparent in two weeks, and after suitable periods of treatment all eighteen patients were considered rehabilitated. This study demonstrates that patients with sprue in relapse are profoundly benefited by the administration of synthetic folic acid.

Diet Low in Salt in Congestive Heart Failure. The use of a low-sodium diet in congestive heart failure is based on the fact that edema fluid cannot be lost without a proportionate decrease in the extracellular salt of the body. Loss

Some nutrition facts that may surprise you:

IF YOU aren't yet familiar with Hemo,† we think you'll be quite a bit surprised when you read the chart below and see how much nourishment in easily digestible form this food drink offers.

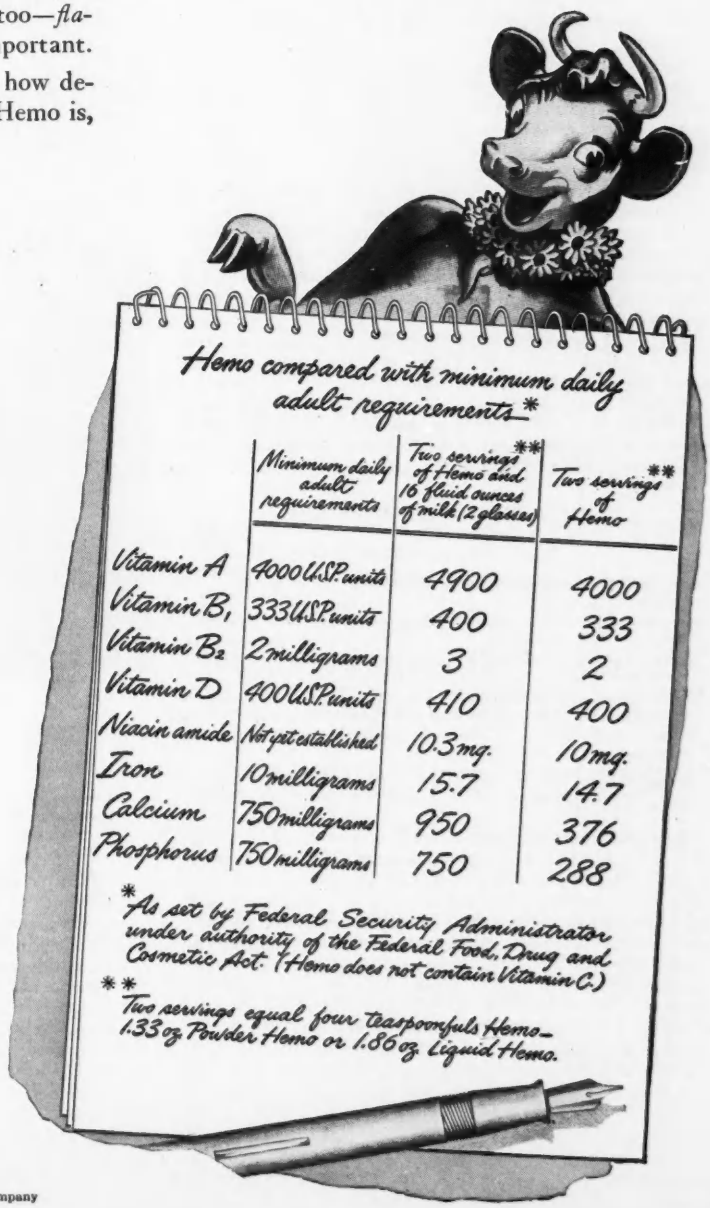
Hemo has been just as carefully developed from another essential standpoint, too—*flavor*. For in a food drink, flavor is important.

So that you may actually know how delightfully rich and milk-chocolaty Hemo is, we suggest you try an occasional glass or cup of Hemo yourself. A twenty-four serving can of Hemo is available upon request.

Write to the Borden Company, Department JA-47, 350 Madison Ave., New York City.

Borden's
Hemo

POWDER OR LIQUID



Hemo compared with minimum daily adult requirements*

	Minimum daily adult requirements	Two servings** of Hemo and 16 fluid ounces of milk (2 glasses)	Two servings** of Hemo
Vitamin A	4000 U.S.P. units	4900	4000
Vitamin B_1	333 U.S.P. units	400	333
Vitamin B_2	2 milligrams	3	2
Vitamin D	400 U.S.P. units	410	400
Niacin amide	Not yet established	10.3 mg.	10 mg.
Iron	10 milligrams	15.7	14.7
Calcium	750 milligrams	950	376
Phosphorus	750 milligrams	750	288

*As set by Federal Security Administrator under authority of the Federal Food, Drug and Cosmetic Act. (Hemo does not contain Vitamin C.)

**Two servings equal four teaspoonfuls Hemo—1.33 oz. Powder Hemo or 1.86 oz. Liquid Hemo.

IF IT'S BORDEN'S, IT'S GOT TO BE GOOD!

Available in all drug and grocery stores!

†Reg. U. S. Pat. Off.

© The Borden Company

of sodium and consequent loss of edema fluid can be brought about either by decreasing the intake or by increasing the excretion of salt. The latter is accomplished by various diuretics, the former by reducing the intake of salt to 1.7 to 2.0 gm. per day in most cases. In the past, however, more stress has been placed upon the restriction of fluid than on that of salt. In this study fifty patients treated within a period of one and one-half years, were given a low-sodium diet with a liberal intake of fluid, in addition to the usual therapeutic measures. The diet used for hospitalized patients contained about 1.5 gm. of salt and 1800 calories. Patients were permitted to drink as they wished, but an intake of at least 2 liters a day was advised. The authors state that the advantages of the regimen are threefold: (a) It frequently controls edema which cannot be controlled by the usual measures. (b) It diminishes the necessity for frequent use of mercurial diuretics. (c) It enables the patients to take more fluid, eliminates troublesome thirst, and insures an adequate intake of fluid to meet the body's needs. Of the fifty patients, four were uncooperative, and in eleven the results could not be evaluated. Of the remaining thirty-five, twenty-two improved. None were made worse.

Simplified Method for Calculating Diabetic Diets. A simplified method for rapid calculation of diabetic diets is presented. Lists of foods which furnish approximately the same amounts of carbohydrate, protein, and fat are shown and the use of these lists in calculation is explained. A sample day's menu is included.

Research Needs. More information is needed concerning the relationship of nutrition to rheumatic fever as well as to resistance to infection in general. Amino acid requirements are not yet known, nor are the human requirements for fatty acids. The role of diet in dental caries has not been shown. While normal requirements for many nutritional essentials are fairly well known, there is a lack of information concerning the effect of disease on these requirements. These are but a few of the basic research opportunities in the field of nutrition.

Caloric Intake and Industrial Output. A small number of well-fed men can produce more than a large number of men on subminimal diets, and attempts to maintain crews of starving men are sheer waste.

THE JOURNAL OF NUTRITION

Vol. 33, January, 1947

*Some effects of dietary zinc deficiency in the mouse. H. G. Day and B. E. Skidmore.—p. 27.
*Seasonal variations in the vitamin A and the carotene content of retail butters. H. A. Ellenberger, N. B. Guerrant, and O. B. Fardig.—p. 39.
*Absorption and storage of vitamin A in the liver of the rat. J. M. Lemley, R. A. Brown, O. D. Bird, and A. D. Emmett.—p. 53.
*Studies in amino acid utilization. I. The dietary utilization of mixtures of purified amino acids in protein-depleted adult albino rats. L. E. Frazier, R. W. Wissler, C. H. Steffee, R. L. Woolridge, and P. R. Cannon.—p. 65.
*The absorption of radioactive iron by children 7–10 years of age. W. J. Darby, P. F. Hahn, M. M. Kaser, R. C. Steinkamp, P. M. Densen, and M. B. Cook.—p. 107.

Zinc Deficiency in Mice. Weanling mice on an extremely zinc-deficient diet were greatly retarded in the rate of growth. A considerable percentage failed to survive more than eight weeks. The animals became emaciated, lost hair from the shoulders and back of the neck, but no truly distinctive gross symptoms were noted. This is regarded as evidence that in nutrition zinc has diverse functions. The catalase activity of the liver and kidneys was markedly reduced. Blood catalase was not affected. The addition of zinc salts to the tissue preparations did not appreciably affect the catalase activity. No changes occurred in liver esterase and in the concentration of riboflavin in liver and kidneys. Histological investigations of the teeth failed to reveal any evidence of change attributable to the lack of zinc.

Vitamin A Content of Retail Butters. A study of the seasonal variations in the vitamin A and carotene of commercial butter as purchased on the Pennsylvania market is described. In the course of a two-year period more than 140 samples of butter were assayed. The average yearly vitamin potency of the six brands of butter was found to be 15,640 I. U. per pound. With few exceptions the vitamin A content of butter was found to exceed the carotene content at all seasons of the year and showed less seasonal variation.

Absorption and Storage of Vitamin A. Equal liver stores of vitamin A were found in both male and female animals when depleted rats were treated for three days with large amounts of vitamin A. The relative amount of vitamin A stored in the liver was determined after treatment with increasing doses. At the lowest intake of 63 units per day the liver storage was 11 per cent of the total dose while maximum storage (37 per cent) was obtained at a daily level of 2000 to 4000 I. U. Further increase in the amount of vitamin A administered was accompanied by a steady decrease in the efficiency of storage. The storage of vitamin A in the livers of rats following oral, subcutaneous, or intramuscular administration was investigated. The oral method was found to be most effective in producing liver storage. Vitamin A injected subcutaneously was approximately 35 per cent as efficient over a five day period as the same amount given orally, while intramuscular injection was only 2 per cent as effective as the oral route.

Amino Acid Utilization. In the biological evaluation of protein, dilution of the test-protein to the point where acute amino acid deficiency occurs prevents an adequate quantitative estimation of nutritive quality. It is suggested that ultimately it may become necessary to evaluate proteins in terms of the limiting action of each indispensable amino acid in the test-protein rather than to attempt to evaluate amino acid levels indirectly by current methods.

Absorption of Radioactive Iron by Children. Determinations of iron absorption on 176 school children, ages seven to ten years, have indicated a mean uptake of 7.75 to 17.55 per cent of a test dose of 2–3 mg. of ferrous iron. The median intake was slightly lower. The uptake was found to be correlated with the estimated yearly increases of body iron during growth; it was not correlated in these children with other factors tested for, such as economic status of the group, dietary intake as estimated, the hemoglobin level, or general nutritive state. A new method for the calculation of iron requirements is outlined. It is estimated from these data that the mean daily requirement of absorbable iron is 2.3–3.8 mg. for children of this age group. It appears that the mean level of approximately 13 gm. of hemoglobin in these children was not limited by iron deficiency.

SCIENCE

Vol. 105, January 24, 1947

*Is sterility induced in growing rats on a tryptophane deficient diet? C. P. Berg and W. G. Rohse.—p. 96.
*The production of experimental pellagra by adenine. S. B. Raska.—p. 126.

Sterility and Tryptophane-Deficient Diets. At the State University of Iowa these controlled experiments and observations proved that a period of uncomplicated tryptophane deficiency in young rats, lasting as long as twenty days, did not induce subsequent sterility.

Production of Pellagra by Adenine. Adenine is a constituent of many enzyme systems essential for life and is part of the structure of the cell. When adenine in the form of free base or mixed with monobasic sodium phosphate was given to dogs for one to three weeks, all symptoms described

CAN ANY INFANT CEREAL COME UP TO THIS?

For ingredients... Clapp's Instant Cereal is made from the following ingredients: whole wheat meal, corn meal, wheat germ, malt, nonfat dry milk solids, calcium phosphate, dried brewers' yeast, salt, and iron ammonium citrate.

For nutritional values... While the quantity of Clapp's Instant Cereal used may vary considerably for the individual, ½-oz. and 1-oz. quantities may be considered average daily amounts for the infant and young child respectively. These amounts furnish the following percentages of the minimum daily requirements:

For infants, vitamin B_1—120%, vitamin B_2—20%.
For young children, vitamin B_1—60%, Iron—113%, Calcium—32%, Phosphorus—22%.

Because the essential Calcium, Phosphorus, and Iron requirements of infants, and the vitamin B_2 requirements of children vary so widely, it is impracticable to establish minimum daily requirements.

Typical Analysis of Clapp's Instant Cereal

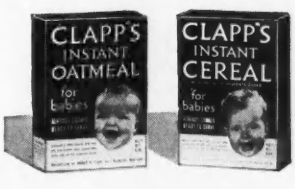
Carbohydrate 73.1%
Protein (Nx6.25) 15.0%
Fat (ether extract) .8%
Ash (total minerals) 3.8%
Crude Fiber 1.6%
Calcium (Ca) 800 mg. per 100 gms.
Phosphorus (P) 580 mg. per 100 gms.
Iron (Fe) 30 mg. per 100 gms.
Copper (Cu) 2 mg. per 100 gms.
Thiamine (B_1) 1.0 mg. per 100 gms.
Riboflavin (B_2) 0.3 mg. per 100 gms.
Moisture 5.7%
Calories per ounce 102.

For taste... Hundreds of cases are on record in which infants who refused other cereals accepted Clapp's Baby Cereals readily. Reports are constantly received from mothers of marked improvement in their babies' appetite for cereal when Clapp's was substituted for brands formerly used.

For texture... The fine, but definite, texture of Clapp's Baby Cereals is readily accepted by babies. This texture, marking a distinct advance over a liquid diet, prepares the infant for later progress to solid food.

The Council on Foods of the A.M.A. suggests that infants' cereals may well be selected upon the basis of furnishing vitamin B_1 and Iron.
Both Clapp's Instant Cereal and Clapp's Instant Oatmeal are excellent sources of these two food elements.

CLAPP'S BABY CEREALS



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Please send me a supply of professional samples of Clapp's Instant Cereal and Clapp's Instant Oatmeal.

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in experimental pellagra in dogs appeared. Opalescence of the cornea, spasticity, and ataxia were observed—all characteristics of riboflavin and vitamin A deficiencies. These syndromes are probably produced by adenine or its metabolites by the combining with constituents of the vitamins or their precursors, thus preventing their utilization in the animal.

AMERICAN RESTAURANT

Vol. 20, December, 1946

Location isn't everything. H. F. Unger.—p. 29.
*Keeping up with your business. A. M. Macfarlane.—p. 31.
Furnishings are focal point of interior. H. J. Harman.—p. 32.
*Meat for the luncheon menu. J. A. Cline.—p. 34.
Cooperation pays dividends. R. Jewel.—p. 60.
December seasonal foods. G. L. Wenzel.—p. 62.
*How to organize for competitive times. J. Porter.—p. 77.

Keeping Up-to-Date. Every restaurant operator must keep abreast of existing knowledge and adjust to changing conditions. The contribution which the person trained in food production and institution management can make to a restaurant is emphasized. The graduate in business administration also has a definite place in the restaurant. A knowledge of business is a requisite for successful restaurant operation. The restaurant operator should have free time to do objective organizing and long range planning; have a good working library; attend conferences, monthly meetings, and short courses, and do work on committees; set up employee training programs. The George-Bardon Bill replaced the George-Dean Act and has increased the annual appropriations for employee training.

Meat for the Luncheon Menu. Luncheon offers an opportunity to stretch the imagination while catering to varied groups. For rapid luncheon service a sandwich-salad luncheon is an excellent pattern for using leftovers. Heavy soup, dessert, and beverage make one of the most popular snack lunches in cold weather. Meat and vegetable casserole with beverage make another popular quick lunch for cold weather. For heavier luncheons a wide choice of meat, and the listing of each meat with one vegetable or a suitable salad should be tried. At luncheon parties plan to serve meat items or main dishes that are generally liked, are attractive, easily served, and economical. Plan menus to provide a moderately light and heavy lunch. This can be done by pricing plates separately.

Ideas for Meeting Competition. Have comfortable and attractive dining rooms, plan and prepare nutritious meals, and cater to your guests by learning their likes and dislikes. A restaurant should be well ventilated, well appointed, and well lighted. The menus should sell by their descriptive terminology, and menus may be sent to offices in advance of service. To have satisactory results there must be good organization from the employees to the executive staff. Frequent short staff meetings are helpful. Equipment should be properly handled. Employees should be trained to know what is expected of them, the food standards, and to provide their needed supplies immediately. Recipes should be standardized and standards should not be changed or lowered.

BETTER FOODS

Vol. 62, December, 1946

*Food facts.—p. 6.
*Turkey—popular and plentiful. C. F. Smith.—p. 19.
Red wines—their taste and usage. R. W. Hawkins.—p. 23.
Chocolate—still another way. B. E. Nettleton.—p. 25.
*Cutlery—precision tools of the kitchen.—p. 28.
*How I use my experimental kitchen. M. Hostetter.—p. 40.

Food Facts. During the war in Germany butter was made from coal. . . . In a new ice cream freezer, 12 oz. of smooth-textured ice cream can be frozen in less than a minute. The small heavy cast aluminum freezer looks very much like an adding machine. . . .Frozen whip topping of pure soy cream is sometimes used as a substitute for whipped cream. It triples in bulk when whipped. . . . It was expected that the year's intake of milk for 1946 would average more than 1 pt. a day or an average of 210 qt. per capita. During the pre-war years 1935–39 only 160 qt. per capita were consumed.

Turkey. Formerly only a holiday treat, turkey is now an all-season favorite. The per capita consumption of turkey in the U. S. has materially increased from 2 lb. for the years 1930–1934 to 4.3 lb. for 1945. The broad-breasted bronze turkey which was introduced on the market several years ago yields a larger proportion of white meat. The sale of half turkeys and turkey in parts will enable a more widespread distribution in the retail markets. The frozen food industry is using an increasing amount of turkey and selling quick-frozen half turkeys, frozen cut-up turkey, and frozen cooked turkey. Turkey is particularly popular in hotels, restaurants, railroads, and all other types of large quantity food service. It is a good profit item, can be cooked well in advance, and then warmed for service or served cold. Any leftover meat on the bird can be served in many ways.

Cutlery. The two characteristics of a good knife are resilience of blade and firmness of cutting edge. A flat ground blade is ground into shallow bevels which form the cutting edge. A hollow ground blade is ground concave high up into the blade. For all but the very expert at sharpening and regrinding cutlery, hollow ground cutlery is the best choice. For best care of knives, the edge should be sharpened before and after each use. The block type sharpening stone is recommended, particularly for hollow ground cutlery. Using a knife when it is dull will ruin the cutting edge and increases the chance for accident. Knives should not be stored loose in a drawer; instead, they should be kept in racks either inside the drawer or hanging on the wall. All cutting should be done on a wooden board.

Experimental Kitchen. The steps in developing a new product in an experimental kitchen are described in detail. Skill, precision, and care are required to develop a product of uniformity and high quality standard. *Proportions* are determined in grams and fractions of grams. *Methods* are checked. The initial experiments test body and texture. Then the best flavor and color are determined by small bore pipettes calibrated in hundredths of a cc. Each product is carefully tested—first by the experimental kitchen staff and then by advertising agency officials. Each new member of the experimental kitchen staff is carefully trained to use the special equipment and apparatus in the kitchen.

BUILDINGS AND BUILDING MANAGEMENT

Vol. 47, January, 1947

*Longer life for resilient floors. D. E. Smalley.—p. 13.
*Maintenance of acoustical materials. G. E. Little.—p. 18.

Care of Resilient Floors. An excess of water is injurious to linoleum; therefore, it should be scrubbed only when no other cleaning method suffices. Never use alkaline cleaners on linoleum; use only neutral soaps. To remove an accumulation of old wax, use a neutral soap with powdered pumice stone. Varnishes and lacquers should not be used on linoleum except when it is nearing the end of its usefulness. Wax—either the solvent type or a water wax—is the best material for maintaining linoleum. The inlaid type of linoleum is the most difficult to maintain. Cork flooring should be cared for much the same as linoleum. A mild

When Nitrogen Balance Must Be Restored

In the correction of protein insufficiency, or in the maintenance of nitrogen balance during periods of increased protein need, distinct advantages accrue from the use of *natural* protein foods in contradistinction to the protein hydrolysates. Accumulating evidence further substantiates the dictum that hydrolyzed protein substances should be employed *only* when oral feeding of protein foods is impossible or not feasible.

It has been shown experimentally[1] when hydrolysates of protein are injected at two different rates (1.0 and 1.5 mg. of nitrogen per Kg. of body weight per minute), the more rapid injection rate results in a higher excretion of both free amino acids and peptides. From further evidence gained in the study of hypoproteinemia states, the authors ventured the conclusion that even in the presence of a definite demand for protein replenishment, nitrogen excretion is predominantly controlled by the kidney threshold.

In a recent survey, Ravdin[2] stated that "when oral feeding is used, whole foodstuffs should be given. There is no beneficence in feeding protein hydrolysates unless there is evidence of faulty digestion. Feeding of mixtures of polypeptides and amino acids may result in an absorption rate of amino acids which is more rapid than can be resynthesized by the liver, especially when the function of this organ is not normal."

When protein foods are ingested, the contained amino acids are released slowly and in a sustained manner during the course of the digestive processes. The absorptive capacity of the intestinal mucosa is not overtaxed, and maximal amino acid utilization is made possible without urinary loss.

As a source of protein, meat ranks high among the foods of man. It is 96 to 98 per cent digestible, and its protein is biologically adequate, capable of satisfying every protein need of the organism.

1. Editorial: J. Am. Dietet. A., 22:1063 (Dec.) 1946.
2. Ravdin, I. S.: Some Problems of Protein Deficiency, Connecticut M. J., 11:7 (Jan.) 1947.

The Seal of Acceptance denotes that the nutritional statements made in this advertisement are acceptable to the Council on Foods and Nutrition of the American Medical Association.

AMERICAN MEAT INSTITUTE

MAIN OFFICE, CHICAGO . . . MEMBERS THROUGHOUT THE UNITED STATES

alkaline cleaner is recommended for rubber flooring. Soaps and solvent-type waxes, including paste wax, should never be used on a rubber floor. Water wax which meets the specifications of the Rubber Manufacturers Association is the best maintenance material for rubber floors. Use water sparingly and never use varnish. For proper maintenance of asphalt tile, mild alkaline cleaners may be used, but they leave the floor lusterless. Soaps may be used and give a more satisfactory appearance. Avoid using too much water. Varnish, floor sealers, or the solvent-type waxes should not be used, but water waxes are recommended.

Maintenance of Acoustical Materials. Painting of acoustical materials offers many problems. If the surface of the material has a fine texture, without perforations or fissures, brush painting is likely to have a noticeable effect on the acoustical efficiency. For this type of surface, spray painting is preferable; the manufacturer of the material should be consulted about the best type of paint to use. If the surface is perforated or fissured, these openings must not be bridged over or filled in with paint. If the size of the perforations or fissures are $\frac{3}{16}$ in. or more in diameter or across the opening, brush painting is not likely to injure the acoustical efficiency. If the openings are less than $\frac{3}{16}$ in., care must be taken to clean the material thoroughly before any paint is applied; then thin the paint and brush it out so as to keep the perforations or fissures as unclogged as possible.

CONSUMERS' GUIDE

Vol. 13, January, 1947

New equipment is on the way.—p. 6.
*The world's menu.—p. 13.

Vol. 13, February, 1947

*Meat grading again voluntary.—p. 8.
*Sweeter days ahead.—p. 11.

The World's Menu. Figures show that the per capita food supplies for the current consumption year are about 5 per cent below prewar. There are still many areas that are far below average and are in need of continuing large imports. If 2550 to 2650 calories are taken as the minimum level of diet, slightly more than half of the world population is receiving less than this minimum. Trade difficulties and lack of transportation mean that much of the food cannot be shipped to the places where it is needed most. Many countries will use their increased yields to ease the living situation in their own regions, rather than exporting the increase. Even the prewar diet was not adequate for everyone, and it will take more food and a more adequate diet to rebuild the war-starved people of the world.

Meat Grading Again Voluntary. As in prewar days, the grading of meat by government inspectors is now voluntary. U. S. grades will appear on meat only if packers request them. During the war approximately 90 per cent of the beef, veal, mutton, and lamb was federally graded and stamped "Choice," "Good, " "Commercial," "Utility," "Cutter," or "Canner." "Choice" was a wartime combination of "Prime" and "Choice." Certain farmers and others used letter grades in place of these terms, but this practice has since been discontinued. Although the characteristics of the various grades differ, the nutritional value is materially the same in all. U. S. grade names are stamped on the cuts of meat with roller stamps which use harmless vegetable dyes for marking. Grading is done by trained experts at an average cost of about 0.03 of a cent per pound. The majority of women seem to prefer graded meat. Also, they desire more boned meats and small cuts and a standardized meat cutting practice over the entire country. Other stamps found on meat products shipped in interstate commerce are the U. S. Inspected and Passed stamps.

Sweeter Days Ahead. Although sugar rationing will be relieved somewhat after April, short supplies throughout the world will still make necessary rationing and price control. Progress has been made in increasing sugar production since the war, but production is still far behind the present demand and the larger world population. A price rise is not the answer to the problem unless we offer to pay so much that nations with scarcer supplies would be persuaded to sell theirs. Last year we consumed a total of 73 lb. per capita as against the 100-lb. average in prewar years. One third of our sugar supply is imported from other countries outside our territories and possessions. Much of the misinformation concerning U. S. sugar exports comes from the fact that American firms refine sugar belonging to foreign countries. An increase of between 700,000 and 750,000 tons of sugar would be required in the U. S. if 5 extra lb. per person and 10 per cent more for industrial users were allowed. The heavy demand is due to the increase in our population and the higher incomes. Other sweetenings are sometimes available if the price is not too high for the purpose desired. Then, too, fresh and dried fruits are good sugar savers as plain or combined desserts.

FOOD INDUSTRIES

Vol. 19, January, 1947

*Frozen food report no. 2. C. R. Havighorst and H. C. Diehl.—p. 57.
*Training the executive—the forgotten man in industry. A. S. Ingleheart.—p. 86.
Flume system aids brining and siruping operations. M. P. Vucassovich.—p. 88.
*Using air filters in food processing plants. A. Nutting.—p. 91.
Processing food for sterilization. C. O. Ball.—p. 98.
*Juicells—new form of canned grapefruit.—p. 101.
Progress in food packaging. S. K. Bradley, N. Allen, and F. W. Lanigan.—p. 104.

Frozen Food. This is the second frozen food report published by *Food Industries*. In this issue frozen food transportation, warehousing, and distributional facilities are described in detail. The marked increase in processing operations threatens to outstrip distribution facilities. Packers must, therefore, pay more attention to transportation and warehousing. Minimum temperature variations in the refrigerator cars are essential. At present a railroad car which would hold sub-zero temperatures is too costly to use. If the present cars are precooled to and held at 10°F. or below, the frozen foods shipped will be within the safety zone. The preferred type of car is a heavily insulated overhead brine tank car. Retail prices reflect the transportation costs in this industry. Shippers prefer to employ the safest, most efficient, and most economical means of transport. The 1946 average rail cost was 0.8 cents per ton mile on transcontinental hauls. Refrigerated truck and trailer shipments will be an increasingly competitive factor. The cost of refrigerated truck service is figured on an hourly basis, not ton-mile. To provide more economical transportation, return pay loads must be secured for both the car and the truck-trailer. Ships are being built with refrigerated facilities for frozen food storage. Storage should be at 0°F. or less. Quality retention is possible only through adequate and strategically located refrigerated warehouses for frozen food storage. The residual storage of fruit is more than four times as heavy as that of vegetables. This is not desirable since the residual holdings are in storage when the new pack is available and create a bottleneck in the warehouses. As nearly as possible, the annual turnover should be complete. In many regions, warehouse construction is delayed because people are not willing to put capital into buildings used for only seasonal occupancy. In many places it would seem logical for the packer, warehouseman, and distributor to make a careful analysis of the problem involved to de-

TWO cups of undiluted Carnation Milk enrich this recipe with the food value of *four* cups of good whole milk! It's a wonderful way to put more milk nourishment into meals. And wonderful, too, is the *velvet blend* that you get in all milk-rich dishes with Carnation Milk—heat-refined and homogenized to super-creamy smoothness! . . . Try this recipe—then write for Carnation's new "Velvet Blend Book," containing dozens more. If you'd also like a *quantity* recipe (serving 48) for Peach Cream Pie, please mention it when you write... *Carnation Company, Dept. 755-B, Milwaukee 2, Wis.*

PEACH CREAM PIE

Milk-rich and luscious!

⅔ cup sugar
⅓ cup flour
¼ teaspoon salt
2 cups Carnation Milk, undiluted, scalded
2 eggs
1 teaspoon vanilla extract
1 9-inch baked pastry shell
14 peach slices

Mix sugar, flour, and salt; slowly add Carnation Milk. Cook in double boiler until thick, stirring constantly. Add small amount of this mixture to slightly beaten eggs; stir into remaining mixture; cook 4 minutes. Add vanilla. Cool; pour into pastry shell. Arrange peach slices on top. Garnish with whipped Carnation Milk and sliced cherry. Chill. Serves 6 to 8.

FOR A Velvet Blend... USE

"From Contented Cows"

termine which of them should provide freezer storage space, its size, and where it should be located. It is almost certain that a smooth flow of frozen foods from the packer to the retailer will be possible only through unhampered, orderly expansion and correlation among production, transportation, warehousing, wholesale distribution, refrigeration equipment manufacture, and retailing.

Training the Executive. The General Foods Corporation developed an executive training course which based its teaching technique on conference meetings. The training period was four weeks, but each week of classes was six weeks apart. The first week consisted of learning about management in general. In the following weeks trainees were shown how each department is organized and operated and its relation to the other departments. The several parts of a manager's job are: (a) to find an opportunity; (b) to analyze that which he finds that he wants to improve; (c) draw plans for improvement; (d) staff and train those who are to carry out the plan; and (e) check. He must also analyze the business for policies, organization, personnel, facilities, and methods; and then apply these areas of analysis to the departments of the business. Controls must be flexible and not too rigid or restrictive.

Air Filters. There are now three methods of reducing air-borne bacteria: (a) ultra-violet radiation; (b) chemical germicides; and (c) electronic filters. The effectiveness of ultra-violet radiation depends upon the intensity of radiation, wave length, and the duration of contact with the bacteria. It is not practical in many commercial places though it is effective against many types of bacteria. Chemical germicides, at present, are considered practical only in medical applications for breathing purposes. Electrical attraction is the means by which the electronic filter removes entrained solids from gases. This latter method has a high efficiency. The two parts of the electronic air filter are an ionizer and a collecting assembly which may be either self-cleaning or feature removable collector plates. Most satisfactory of the filters are the mechanical and electronic types.

Juicells—New Form of Canned Grapefruit. By a patented mechanized process, grapefruit can now be prepared as a heavy suspension of cells of the fruit in the sweetened juice of the fruit. This new process eliminates the grading of grapefruit for size and variety. After being washed, the grapefruit is cored, everted (turned inside out), and depulped. After the decelling process, the pulp is mixed with the juice and then conveyed on a screen which retains only the cells. The cells pass along an inspection table where any remaining seeds and rag pieces are removed. A predetermined amount of sugar is added to the juice, and then the cells and juice are combined again in a mixing tank. The product is then pumped through a pasteurizer and thence to the can filler. From that point on, it is handled in the conventional manner. Production cost of the juice cells is small in comparison with production cost of segments.

THE NATION'S SCHOOLS

Vol. 39, January, 1947

*Lunch program criticized. E. B. Elliot.—p. 28.
*School health program grows. W. M. Lamers.—p. 31.
*Who purchases foods for cafeterias?—p. 56.

Lunch Program Criticized. The school lunch program of the U. S. Department of Agriculture was severely criticized at the annual conference of the Council of State School Officers held in St. Louis. It was suggested that better school lunch programs can be provided if the federal government provides funds for the state educational departments to carry out administration and supervision in the schools.

Health Program Grows. Cooperating independent agencies in Milwaukee have helped to solve school health problems since 1919. To add to this service the public schools have provided educational services, such as health training, physical education, athletic, special, and corrective programs. The city health department has made available certain professional services, such as medical, dental, and nursing. A new cooperative experiment has been planned with a view to improving their joint health program. In this experiment, the public schools have conceived of a fivefold health task as part of their five-year program of overall curriculum revision. The statement of purposes shows that the program should be correlated closely with real life, and that the person should learn, in time, to make intelligent use of professional health services. Resources are being studied to discover what is available in all fields for achieving health aims. The core of the new health education program is growth in healthful personal and community living. In close relation to this curriculum program, the health department is undertaking an intensive review and an experimental extension of its school health services.

Purchases for Cafeterias. This article reviews the purchasing procedure of three different school cafeteria systems. In some places, canned goods may still be purchased by setting specifications and obtaining competitive price bids. However, this is not generally true at present, although competitive prices are sought as much as possible. Equipment may be bought by the food service director with the approval of the superintendent. If feasible, perishables are bought on visits to the markets by the manager or an assistant. In general, the cafeteria manager does the marketing and ordering of the food because she knows what kind and quantity of food is needed, and consequently, the amount of waste is reduced.

PERSONNEL JOURNAL

Vol. 25, January, 1947

*Review of personnel progress. L. K. Johnson.—p. 242.

Personnel Progress. Organized personnel programs were begun during the first World War to obtain adequate supplies of labor, reduce labor costs and turnover, and to improve the employee morale. The policy of transferring the authority to hire and fire from the foremen to newly created personnel departments led to friction and lack of cooperation among the personnel department, foremen, and line executives, and as a result personnel management failed in its major objectives during this period. In time, however, greater respect for and cooperation with the personnel department developed. Recognition was gained by changing some of the techniques and procedures formerly used. There was a return of the ultimate responsibility for hiring and firing to the foremen and their superiors. Personnel executives assisted the foremen and line executives by improving and expanding the internal structure of the personnel department to provide more effective service. Subsequently it was learned that employee services are not a substitute for sound personnel management and that if they are to be successfully incorporated in a personnel program, workers should be allowed to select the services desired and be required to contribute to administration of the program as well as to its financial support. Also it has been learned that personnel decisions must be based upon facts rather than rule of thumb. Currently a psychological method of meeting personnel problems is being recognized. This is a preventive approach which attempts to adjust possible points of conflict before the conflict arises. It is an attempt to adjust workers to their job, develop their abilities, and provide psychological satisfactions.

Post Scripts ... by Bob Dall

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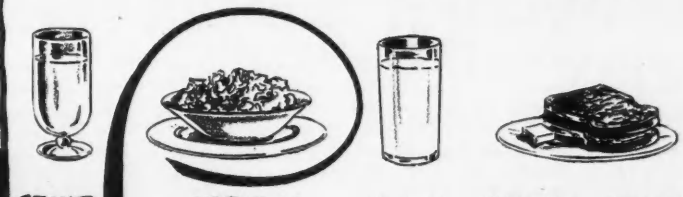

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News Notes

Veterans Administration Dietitians Meet in Chicago. Charles G. Beck, deputy administrator, Veterans Administration Branch Office No. 7, opened the first conference for dietitians held January 27–29 in Chicago with a discussion in which he stressed the numerous administrative responsibilities of the dietitian. Dr. Delmar Goode, branch medical director, outlined medical responsibilities.

The theme of the conference was teamwork. Material was presented through talks, demonstrations, clinics, round-table discussions, and question periods following each part of the program. Doctors, administrators, dietitians, nurses, and students participated. Twenty-four conferees were in attendance. The second session of the conference was held at Hines, Illinois, and the third at Downey, Illinois. Conducted inspection trips through the dietary departments of these hospitals were also part of the program.

Grace Bulman, chief, Dietetic Division, Central Office, Washington, discussed dietetic plans now under development. She also talked on "Qualifications and Procurement of Dietitians."

Gladys Hall, Executive Secretary of the American Dietetic Association, gave an overall discussion on "Professional Opportunities."

Resumés on the administration of the various offices of the Branch, intended to point the way to the contribution which the dietitian may make and to show wherein teamwork may be further developed, were given. Among others from Branch Office No. 7 giving talks were: Dr. Russell Hiatt, director, Professional Service; Wales Finnegan, director, Medical Administration; and Marie Brophy, chief, Nursing Section.

E. L. Martinson, director, Construction and Supply, advised that "every dietitian might prepare an indexed library of information of construction and equipment. The library might also include samples of colors and color combinations available in wall finishes, floor coverings, tile, and other materials to be used to plan for beauty as well as utility." He further advised that the dietitian should be a part of the planning team. He showed a workable device using a blueprint and heavy cardboard cut-outs drawn to scale and representing equipment the dietitian finds essential for carrying out the project under consideration. These cut-outs may be shifted around on the blueprint, thus making more efficient planning possible.

A round-table discussion on organization was also held.

In his talk on "Utilization of Dietitians by the Medical Staff," Dr. A. Rodriguez, clinical director, Downey, Illinois, emphasized the need for special training for the dietitian who is part of the treatment team for the neuropsychiatric patient. Dr. Joseph C. Tatum, chief, Rehabilitation Service, discussed "Feeding Problem Cases," while Georgia P. Cox, chief nurse, and Harriet Grunow, dietitian, discussed ward service and diet therapy.

Henrietta T. Wells, Danville, Illinois, led a discussion on the care of neuropsychiatric patients and was joined by Maurine H. Lanier, Downey; Evelyn Beuchler, Marion, Indiana; Norma Vesperman, Mendota, Wisconsin; and Rita Black, Tomah, Wisconsin. All are chief dietitians in neuropsychiatric hospitals. Dr. Delmar Goode, medical director, Branch Office No. 7, stressed the need for study and research in regard to dietetic care of neuropsychiatric cases.

Dr. Andrew G. Goesl, assistant chief, Tuberculosis Section, Branch Office No. 7, and Dr. Arnold Shamaskin, chief, Tuberculosis Service, Hines, discussed dietary care of tuberculosis patients.

A dish sanitizing technique now under development was covered by Grace Schweiger, chief dietitian, Waukesha, Wisconsin. The technique includes employee training in machine operation and separation of contaminated and clean workers and dishes. The marked advancement in sanitary technique has been utilized in these new procedures.

"Utilization of Dietitians by the Medical Staff," was the title of the talk given by Dr. Norbert Trauba, clinical director, Hines, in which he pointed out the many areas in which the dietitian can contribute to teamwork in the care of the patient.

Dr. Lyle Baker, chief, Medical Service, Hines, reviewed and evaluated the present trends in diet therapy, with emphasis on cardiac, kidney, and liver diseases. A demonstration entitled "Teaching the Diabetic Patient" followed, showing the teamwork being done by the doctor, nurse, and dietitian.

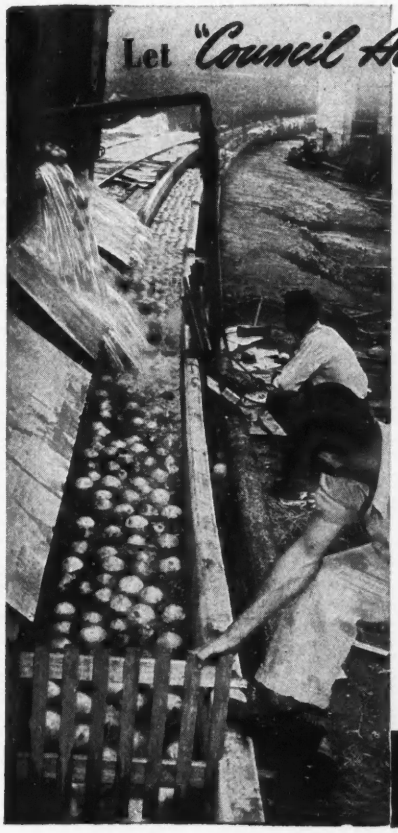
Dr. Charles E. Peustow, deputy chief, Surgical Service, Hines, talked on "Pre- and Post-Operative Dietary Care of the Surgical Patient," stressing its importance and the need for increased dietary care, study, and maintenance of records. Again a demonstration followed.

Refresher courses for employees constituted the subject for a round-table discussion in which Mae Whitmer, assistant chief, Branch Office No. 7; Bonnie Beilfuss, instructor in dietetics, Hines; Naomi W. Zuba, instructor, Downey; and others reviewed an abundance of material which has been developed.

Marguerite Anacker, Wood, Wisconsin; Mary Aschenbrener, Marion, Illinois; Margaret McDonald, Dwight, Illinois; Ida Halliday, Indianapolis, Indiana—all chief dietitians—and others presented material on teaching employees. Orientation, sanitation, and safety were some of the topics covered by reports, motion pictures, posters, and demonstrations.

In a round-table discussion entitled, "Coordination of Professional Activities," Dr. Thelma Porter, professor of nutrition and chairman, Department of Home Economics, University of Chicago, discussed education; Dorothea F. Turner, assistant professor, Department of Medicine, University of Chicago, outlined clinic organization; Dr. Margaret Hessler Brooks, assistant professor of nutrition and counselor for student dietitians, University of Chicago, spoke on diet therapy; Bertha Biltz, Administrative Adviser, American Dietetic Association, spoke on administration.

Kathryn McHenry presided and coordinated topics and also raised various questions concerning activities of a dietitian and the different types of organization in a hospital. The desirability of teaching certain material at the high school, college, or student training level was discussed; and also whether a condensed foundation course in all specialties



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could be given which would enable the dietitian to develop and coordinate activities better until such time as more dietitians have specialized and procured higher degrees.

Plans for further development of nutrition clinics, both in-patient and out-patient, were discussed by Miss McHenry. Ruth Kahn, chief dietitian, Hines, talked on the organization of a clinic.

School Lunch Equipment Conference. A school lunch equipment conference was held in Washington from February 5 through 7. It was called by the Production and Marketing Administration of the USDA to lay plans for the development of materials to help state agencies in the selection and use of equipment for school lunch programs. Discussion centered around the kinds of help needed by schools. Recommendations were made for research. Lists of both small and large equipment for various sizes of school lunchrooms were reviewed and evaluated. Tentative lists agreed upon by the group will be sent to school lunch leaders throughout the country for their comments before they are given general distribution.

Persons outside the government who participated in the conference were Bessie Brooks West, Kansas State College; Rosalie S. Godfrey, University of Texas; Orpha Mae Thomas, Teachers College, Columbia University; Edith Cushman, Connecticut State Department of Education; and Eleanor Pryor, Georgia State Department of Education. Other federal agencies represented included the Bureau of Human Nutrition and Home Economics, U. S. Office of Education, U. S. Public Health Service, and Rural Electrification Administration.

Publications relating to storage of food, dishwashing, management, and scheduling of workers will be developed by the federal government as a result of this conference. The conferees will review the materials and offer suggestions to make them as useful as possible to school lunch supervisors and managers before they are put in final form.

New Nutrition Association. The newly formed Nutrition Association of Greater Cleveland is a combination of two services—the Nutrition Service of the Greater Cleveland Chapter of the American Red Cross and the Nutrition Service of the Cleveland Health Council. It will be sponsored jointly by the Red Cross and the Community Chest.

Elisabeth Whipple, director of the new Association, has been chief of the Nutrition Department of the Forsyth Dental Infirmary for Children in Boston and has taught in the graduate public health nutrition program at Simmons College. Previously she had been the consultant in nutrition for the Michigan Department of Health; nutritionist in the Emergency Relief Administration in Grand Rapids, Michigan; and dietitian of Grace Hospital, New Haven, Connecticut. Marjorie Young, assistant director, was recently separated from the WAVES after having served two and one-half years as communications officer. She holds a master's degree in nutrition from the University of Chicago, where she worked with Dr. Lydia J. Roberts and others of the University of Chicago staff in studies on nutrition of children.

In the overall program of the Nutrition Association, the nutritionists will act as consultants to the staffs of public health agencies, conduct classes, aid in school nutrition programs, prepare newspaper articles, exhibits for loan, radio talks, publish a monthly bulletin for public health people entitled *Nutrition Wise*, and supervise field work of graduate public health nutrition students and dietetic interns.

Dr. Helen A. Hunscher, President-elect of the American Dietetic Association, is chairman of the Professional Advisory Committee of the Association. The Board of Trustees includes members from the advisory committees of the Cleveland Health Council Nutrition Service and the Nutrition Service of the American Red Cross, Greater Cleveland Chapter.

Fiftieth Anniversary. This year marks the golden anniversary of the School of Home Economics at Michigan State College. Special features of the celebration have been planned to continue at intervals throughout the year.

The first event in the celebration program was a luncheon on November 13 to honor the many womens' groups of Michigan which have been instrumental in helping to establish home economics as a recognized field of study. Thirty persons representing various womens' organizations of the state attended.

The high point of the year will be a celebration on May 2 and 3. An open house with special exhibits, programs with outstanding speakers, a pageant portraying the fifty years of home economics at Michigan State College, honors for alumnae, and reunions will be the highlights of the two days. The theme of the program will be the effect of the present social, economic, and political forces on the stability of the American home and the contribution of home economics to increasing its stability.

As a special feature, a conference and workshop in home management will be held in July for college teachers, extension specialists, and others working professionally in this field. The conference for one week will give an overall view of the many phases of home management with special lecturers invited to participate.

The Farm and Urban Women and Homemaking Teachers in their summer conferences will join the celebration with special events added to their programs.

AHEA Personnel. In February *Mildred Horton* became executive secretary of the American Home Economics Association. Miss Horton, a native of Dallas, Texas, comes directly from the teaching staff of the Texas State College for Women, bringing with her twenty-five years of experience with the Texas Extension Service. She has taken part in two special White House Conferences. In 1941 she served as chairman of a land grant college committee that helped plan extension's part in the national nutrition program and to urge legislation to provide a home demonstration agent for every county in the nation. In 1940 Miss Horton was appointed by the governor of Texas as the first chairman of the State Nutrition Council. The following year she was one of Texas' representatives at the President's Nutrition Conference. She has served as president of the Texas Home Economics Association and chairman of the extension department and vice-president of AHEA.

Keturah E. Baldwin, recently retired business manager of the American Home Economics Association, has been appointed secretary of the Permanent Headquarters Fund of the AHEA. In her new position she will handle the Association's drive for a "Home for Home Economics." The drive was launched last June at the Association's annual meeting in Cleveland, at which time the goal of $250,000 to be raised by 1949, the Association's fortieth anniversary, was set.

Argentine Nutritionist Retires. Dr. Pedro Escudero, for twenty-five years a professor at the University of Buenos Aires, retired from teaching on August 29, 1946. He was the first to hold the chair of nutrition created in 1937. Previously he was professor of clinical medicine. Dr. Escudero was one of the first men in Argentina to recognize the tremendous importance of nutrition, and his life has been devoted to the single purpose of educating and helping his countrymen in this field. The foundation of the Municipal School of Dietitians, founded in 1934, was largely a result of his tireless crusade. Professor Escudero is the author of many books and articles, and is the editor of the *Revista de la Asociacion Argentina de Dietologia* regularly abstracted in this JOURNAL. —*Translated from* Dietologia *by the late Mrs. Margaret Shatswell Price.*

Salads that bloom in the Spring

"Dairy Foods Should Be Daily Foods." And, a tempting way to get more dairy foods into the daily diet is to serve exciting, new Spring Salads. The latest issue of the Sealtest Food Adviser features three new salads, including the dainty Cottage Cheese Salad Rings illustrated above. Included, also, are a number of other new and delicious dishes which contain nutritious milk, cream, buttermilk, ice cream, cottage cheese or other dairy products. All of them have been created and tested in the Sealtest Laboratory Kitchen and are offered free to teachers and housewives. Send for your copy, today.

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Two-day Continuation Course in Clinical Dietetics. The University of Minnesota conducted a course in Clinical Dietetics at the Center for Continuation Study on February 28 and March 1. The program included a series of discussions in which physiology, metabolism, and pathology were correlated with diet therapy. The faculty for this intensive course were from the staff of the University of Minnesota Medical School and the Mayo Foundation.

Tri-State Hospital Convention, May 5-7. The Palmer House in Chicago will be the scene of the three-day Tri-State Hospital Convention to be held May 5, 6, and 7. The Dietetic Section meetings will be on Tuesday and Wednesday afternoons, at which time Kathryn A. McHenry, president of the Illinois Dietetic Association, will preside. Among the speakers are R. E. Neff, superintendent, Methodist Hospital, Indianapolis, whose subject will be, "The Dietitian's Status," and Miriam Lowenberg, Rochester, Minnesota, who will speak on "Nutrition for the Child of the Community." A forum discussion of "Problems in Hospital Food Service" is scheduled for Wednesday afternoon.

A.D.A. Represented at UNESCO Conference. The American Dietetic Association was one of approximately 1000 national organizations which took part in a conference on UNESCO (United Nations Educational, Scientific and Cultural Organization) in Philadelphia, March 24-26. Lucille M. Refshauge, Educational Director, and Anne Stewart Miller, Legislative Chairman, acted as representatives of the Association at these meetings. Various sections discussed such topics as: "Problems of Educational Reconstruction"; "How Do We Teach for International Understanding?"; "Revision of Textbooks and Other Teaching Materials"; "The Natural Sciences in UNESCO"; and "Books and Libraries in UNESCO's Program." The purpose of the conference was to outline the broad functions of UNESCO, its recommended projects, and the procedures by which organizations and individuals in the U. S. can assist in obtaining nationwide understanding and support of its program of peace through understanding.

Conference on Maternal Health. On February 21 and 22 a Conference of the Committee of the Food and Nutrition Board of the National Research Council on Methods of Evaluating Nutritional Status of Mothers, Infants, and Children was held in Detroit at the Children's Fund of Michigan, under the direction of Dr. Icie Macy Hoobler. The participants included Katherine Bain, Otto Bessey, Bertha Burke, Charlotte Chatfield, William J. Darby, Eva Donelson, C. A. Elvehjem, Wendell H. Griffith, George M. Guest, Millicent Hathway, D. Mark Hegsted, Helen A. Hunscher, C. G. King, Miriam Lowenberg, L. A. Maynard, J. P. Pratt, Lester Sontag, Adelaide Spohn, Genevieve, Stearns, Hazel Stiebeling, Dorothy Wiehl, and James R. Wilson.

Among the topics on the agenda were a discussion of the comparison of short-cut dietary evaluations and their relative values in nutritional status studies, and the formulation of a simplified, practical, and acceptable method for use by physicians in evaluating maternal food consumption as a means of determining the role of nutrition in toxemia of early and late pregnancy, in prematurity, and in antenatal and postnatal mortality and morbidity.

Institute in Public Health Nutrition. The College of Home Economics, Syracuse University, has announced that a two-week Institute in Public Health Nutrition will be held July 7 to July 19.

Public Health Nursing Week. April 20-26 will be celebrated as Public Health Nursing Week, marking the seventieth anniversary of public health nursing in the U. S. Specific objectives of the week will be to recruit 8000 public health nurses urgently needed throughout the country, to promote better understanding of public health nursing as a service for everybody, regardless of size of income, and to encourage the organization of public health nursing services wherever they are needed.

Cornell Introduces New Course in Frozen Food. With the spring quarter, hotel students at Cornell University will be offered a new seminar course in frozen food. It will be planned to give an overall view on new developments in the frozen food field and will be given by members of the teaching and research staffs of the School of Nutrition of the College of Home Economics and of the New York State Experiment Station at Geneva. Topics to be covered will include selection and processing of fruits, vegetables, and meats; quality control; the effect of freezing and storage on flavor and appearance; and the cooking and thawing of frozen foods. The new course will supplement the course introduced last year on zero refrigeration, which emphasized mechanical aspects of quick-freezing and storage of food.

Mrs. Margaret Shatswell Price. The JOURNAL office has been both shocked and saddened by news of the recent death of Mrs. Margaret Shatswell Price in Winter Park, Florida. Mrs. Price and her husband both died as a result of burns incurred in a fire in their home caused by contact of an electrical wire with a highly inflammable paper which Mr. Price made for use by magicians. Their fourteen-month-old daughter was rescued without injury. Mrs. Price had for some time made regular contributions to the Current Literature Section of the JOURNAL, having translated and abstracted the French, Italian, and Spanish journals. Mrs. Price took her student dietitian's training at Florida State College for Women.

Honor to Colonel Lawrence. The Bronze Star Medal with Oak Leaf Cluster was awarded on January 17, 1947, to Colonel Charles S. Lawrence, commanding officer, Quartermaster Food and Container Institute of the Armed Forces in Chicago —the center of the world's most extensive food and container research and development program. Presentation was made by the Quartermaster General of the Army, Major General Thomas B. Larkin, in recognition of outstanding and courageous action against the Japanese during the seige of Bataan on April 9, 1942.

Army Medical Library Microfilm Service. During the war, the Army Medical Library, through its photoduplication services, supplied millions of pages of microfilmed medical articles to the armed services and other research agencies. This service is now generally available for civilian physicians, institutions, and research workers on a cost basis. This means direct access to the library's enormous resources of medical literature. Order blanks are available upon request from the Army Medical Library, Seventh St. and Independence Ave. S.W., Washington 25, D. C. Microfilming from monographs costs 50 cents for fifty pages or less. Photostats are also available at a charge of 50 cents for ten pages or less.

Eight Dietetic Interns Complete Training. In December, eight students in training became full-fledged dietitians upon completion of their year's internship at *Michael Reese Hospital*, Chicago. They are: Paschal Chapman, University of Georgia, Athens; Dorothy Deane Dowell, University of Nebraska, Lincoln; Betty Lou Guge, University of Missouri, Columbia; Ethel Haga, Iowa State College, Ames; Carolyn Maderer Leone, University of Illinois, Urbana; Janet E. Roberts, Iowa State College; Cissy Shigetomi, Colorado State College, Fort Collins; and Marjorie Osborne Waid, Marshall College, Huntington, West Virginia. Thirteen more dietetic interns will complete their training in June at Michael Reese.

Three new students have begun their year's internship at *Milwaukee County Hospital*, Milwaukee, Wisconsin.

Dietitians Spotlighted in Metropolitan Newspaper. A full-page feature showing the hospital dietitian and student dietitian at work was published in the Cleveland *Plain Dealer Pictorial Magazine*, January 26, 1947. Subjects of the pictorial story were the members of the St. Luke's Hos-

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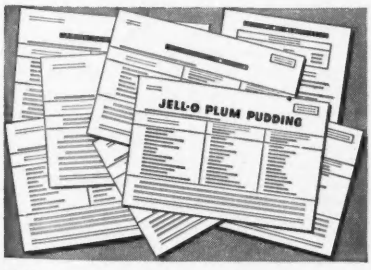

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pital. Helen Robertson, chairman of the A.D.A. Public Relations Committee, planned the presentation, which gave the profession a "dignified push."

Correction. In a recent letter from Diana Y. Ten Haaf, president of the Dutch Dietetic Association, she calls our attention to an error in the JOURNAL. In the December issue an article on the food situation in Holland, written by Hermine Zoethout was published. In it, Miss Zoethout's position was given as "Teacher of Dietetics." Miss Ten Haaf points out that Miss Zoethout is not a teacher in dietetics, but rather a domestic science teacher (or teacher in cookery) of the staff of the Education Bureau of the Nutrition Board.

British Publication Available. The Ministry of Food, London, England, has announced that with the relaxation of printing difficulties its monthly magazine, *Food and Nutrition*, is now available to a wider circle of readers. Subscriptions may be obtained by writing to the Director of Publications, H. M. Stationery Office, P. O. Box No. 569, London, S. E. 1. It is the purpose of this magazine to interpret food news and encourage the study of food values. Each month an item about a basic food will be published as part of a series.

Feeding-in-Industry Conference. On March 5 a conference, sponsored by Columbia University's School of Public Health was held in New York City to make nutrition information available to industries in the city which are interested in developing or expanding feeding facilities for employees. Cooperating with Columbia in sponsoring the conference was the State Department of Labor, the New York City Department of Public Health, and the U. S. Department of Agriculture. One of the speakers at the conference was Wintress Dalbey Murray, nutrition adviser of Eastman Kodak Company, Rochester, New York. Mrs. Murray stressed the value of educational programs to help employees select balanced meals, pointing out that the avoidance of "hidden hunger" caused by deficiency of nutrients will make employees enjoy even better health, and that management can then add this benefit to what has already been done to reduce fatigue and accidents and improve efficiency and morale with in-plant feeding.

Pupils Select Poor Lunches. Five elementary schools in Chicago have participated in an experiment to discover whether the school lunch program could continue without government subsidy and whether the students could pay full charges for lunch. Formerly students were furnished a plate lunch paid for in part through federal and state subsidies. The results of the experiment showed that although the cost of school lunches could be carried entirely by the pupils, the choice usually made was far less nutritious than the lunch obtained under the subsidy program.

Nutritive Value of Vegetables. Tops of root vegetables should be cut off as soon as possible after purchase since the leaves draw moisture and nutrients from the vegetable. USDA plant scientists explain that while the plant is growin the ground, the leaves manufacture sugar, starch, protein, and other nutrients and pass them down to the roots for storage. However, when the vegetable is harvested and the roots are out of the ground, the procedure is reversed and the leaves draw on the moisture and nourishment of the roots to remain alive.

Because turnip greens are so prominent in southern diets, the Texas Experiment Station recently made tests to determine the mineral value of leaves and stems. Although the leaves proved to have more nutritive value of calcium and iron, the stems have enough to warrant their use. Some people object to the fiber or "stringiness" of the stems, but to many they are useful as roughage in the diet.

Riboflavin in Cooked Beef. Recent tests of cooked western beef made at the Montana Experiment Station showed practically no loss of riboflavin in rib cuts or canning beef. When corned beef is cooked, however, there was considerable loss. Although little loss occurred during corning, only 45 to 72 per cent of the riboflavin remained after cooking.

Cheese Consumption Grows. Civilian consumption of cheese reached 7 lb. per capita in 1946—the highest in history, according to USDA figures. For twenty years before the war, the per capita consumption averaged around 4.5 lb. Of the 7 lb. of cheese consumed by the average American in 1946, 4.8 lb. were American Cheddar and only 2.3 lb. of all other varieties.

Dry Milk Supplies. Production of dry milk—whole and skim—has tripled in the last ten years. The war was responsible for the great increase in dry skim milk production, because of its high nutritive value, low cost, and low volume. Until now the baking industry has been the largest civilian user of dry skim milk with hotels and restaurants using fairly large amounts. This year, for the first time, small consumer packages of dry skim milk will be appearing on the grocery shelves.

Large Strawberry Crop Expected for 1947. Strawberry plants now occupy 119,000 acres, 31 per cent more area than last year. With good weather, the crop this year may approach the big prewar crops, and with strawberry pickers more plentiful this year, harvesting will not be so handicapped by a labor shortage. Harvesting moves north with the spring. The season starts in December when Florida berries are on the market and continues until June when Oregon, Washington, and Michigan berries become ripe.

Avocado Ice Cream. The smoothness of avocado pulp and its milk flavor make it well adapted for ice cream manufacture. When no other flavor is added, avocado ice cream has a delicate nutty taste. Because the fruit is rich in oil, it adds the desired richness to ice cream, and in some mixtures, it permits the use of less cream. Frozen avocado mixtures should not be stored long, because the oil may take on a rancid flavor. Avocado production has greatly increased in recent years. As a result, sound fruit, unsuitable for fresh sale because of small size or slight blemishes, is now sufficiently inexpensive to be used profitably in ice cream manufacture.

Turkey Plentiful. Buyers and food service managers in hospitals and industrial cafeterias are urged by the U. S. Department of Agriculture to help in the marketing of record turkey stocks by promotion campaigns to increase the consumption of turkey. The industry has indicated that stocks consist principally of heavy tom turkeys, suitable for group feeding, and that the price is at a level which should be attractive to buyers for quantity food services.

News of State Associations

Alabama Dietetic Association. A "refresher day" for dietitians, school lunch managers, and home economists was held by the Alabama Dietetic Association on February 8 at Hillman Hospital Auditorium, Birmingham. There was a record attendance of 123 persons, including some out-of-state visitors. Mrs. B. Abercrombie, director of the school lunch program, Atlanta, Georgia, spoke on "The School Lunch." Dr. Tom Spies and Dr. Robert F. Stone gave a clinic demonstration on "Nutritional Deficiencies," and Dr. James S. McLester presented the topic, "Protein Comes into Its Own." Anna Tracy spoke on "Some Personnel Aspects of Institution Management," and Virginia Harger, Assistant to the Executive Secretary of A.D.A., brought "Messages from the Executive Office." The spring meeting of the Alabama Dietetic Association will be held April 26 at the University of Alabama, Tuscaloosa.

California Dietetic Association. In September the first council meeting of the year was held in Los Angeles. The president, Margaret Anderson Clover, Scripps Metabolic Clinic, La Jolla, presided. Other officers are: President-elect, Helen H. Anderson, Stanford Hospital, Palo Alto;

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Vice-president, Clancy Morrison, Occidental College, Los Angeles; and Secretary, Evelyn Langenwalter, St. Luke's Hospital, San Francisco. The mid-year council meeting was held in San Francisco on February 14 with sixteen members present. Reports of progress were made by the committees.

Dr. Evelyn Blanchard, chairman of the *Bay Section*, reports that the section had held four meetings from September through February of this year.

Los Angeles Section. The November meeting was held at the California Hospital, at which time a film was presented by representatives of the Bird's-Eye-Schneider Company. Following the film, a discussion on methods of cooking frozen foods in large quantities was held. Reports of the national convention in Cincinnati were given by Elizabeth Starr, chief delegate, and Essie Elliott. At the Christmas meeting, the dietetic interns of the Veterans Administration Hospital presented an amusing skit on the "Night Before Christmas in the Main Kitchen." Marjorie Glass told about her new book on hospitality and table setting. The meeting was held in the Red Cross Chapter House under the leadership of Una Steen, program chairman.

San Diego Section. A joint meeting with the Home Economics Association was held in October at the San Diego High School. The field secretary of AHEA and the president of the California Home Economics Association were guest speakers. At the November meeting, the A.D.A. meeting in Cincinnati was reported. The January meeting was devoted to community nutrition. Jane Sedgwick, nutritionist with the California State Youth Authority, explained the "Short Cut Method of Evaluation of Diets" as used in her work in state penal institutions and road camps.

Santa Barbara Section. Four meetings and a Christmas party had been held from September to February of this year. The first meeting was a dinner and business meeting on September 18. The following officers were elected: Chairman, Marjorie Sheridan, St. Francis Hospital; Vice-chairman, Jane Wagner, Cottage Hospital; and Secretary-Treasurer, Sonia Allen, Sansum Clinic. The November meeting was devoted to a report of the A.D.A. convention by Ruth Bowden. In January the meeting was turned over to the Diet Therapy Section, and at the February meeting, Dr. Hugh A. Cunningham, chief of anesthesia, St. Francis Hospital, spoke on "The Growth of Anesthesia."

Colorado Dietetic Association. New officers not previously reported are: Secretary, Mary Bedford, Presbyterian Hospital, Denver; Treasurer, Roberta Kennedy, Colorado General Hospital, Denver; Community Nutrition Chairman, Elizabeth Dyar, Colorado A. & M. College, Ft. Collins; Food Administration Chairman, Rosamond Acker, Denver General Hospital; Professional Education Chairman, Mabelle Williams, Lutheran Sanitarium, Wheatridge; and Diet Therapy Chairman, Margaret McNamee, Colorado General Hospital.

Connecticut Dietetic Association. The annual meeting was held October 30 at St. Raphael's Hospital, New Haven. Margaret Gillam, consultant, American Hospital Association, led a round-table discussion on "Kitchen Planning and Equipment—Present and Future." The Community Nutrition and Professional Education Sections were addressed by Martha Smith Fry, special field representative on nutrition for the New England area for the American Red Cross. The afternoon session was devoted to diet therapy, at which time Dr. Elmer Alpert, Bellevue Hospital, New York City, and a member of the nutrition clinic of the New York City Department of Health, spoke on the work done at that clinic. He illustrated his talk with interesting slides.

Florida Dietetic Association. The thirteenth annual meeting of the Florida Dietetic Association is scheduled for April 11 and 12 at Soreno Hotel, St. Petersburg, Florida. Mable MacLachlan, president, American Dietetic Association, will be guest speaker.

Georgia Dietetic Association. The Georgia Association was invited by the Alabama Dietetic Association to meet with them this spring. The *Atlanta Dietetic Association* is growing rapidly and meetings are held the first Monday of each month at the American Red Cross meeting room. On February 3, about fifty members heard Miss McNeal, fashion specialist from Davison's, discuss "Spring Fashions for Career Women." The topic for the March meeting was "Flower Arrangements."

Hawaii Dietetic Association. Officers elected for 1946–47 are: President, Frances Janda, St. Francis Hospital; Vice-president, Marjorie Abel, Board of Health; Secretary, Mary Pitman, Honolulu Vocational Schools; and Treasurer, Mary Lum, Kapiolani Maternity Hospital. Newly appointed section chairmen are: Diet Therapy, Mary Murai, Kuakini Hospital; Professional Education, Katherine Gruelle, University of Hawaii; Community Education, Helen McGill, Department of Public Instruction; and Food Administration, Dorothy Osler, Leahi Hospital.

The island group had as guest speaker for its November meeting Genevieve Callahan, who is doing research work for the Dole Pineapple Company of California. The December meeting featured Marjorie Heseltine, consultant nutritionist of the Children's Bureau, Washington. In January, a luncheon meeting was held at which Lorene Kulas, head dietitian at Queen's Hospital, presented highlights of the A.D.A. Cincinnati meeting. Recently, members participated in a special tour of a pineapple factory located in Honolulu.

Illinois Dietetic Association. The Association now has a central office at 116 South Michigan Avenue, Room 704, Chicago 3. All correspondence may be sent to this address in care of Dorothy Jutton.

Aileen Merwin, Professional Education Chairman, has announced that the teaching dietitians of Chicago are meeting once a month to discuss problems in the teaching field and to work on the project of this section. Topics outlined for study include: question construction, recommendations for dietary experience of student nurses, and the collection of visual aid material. Mae Whitmer has been appointed subchairman of the professional education section to direct the activities in recruitment of dietitians in high schools and colleges.

Sue Head is now chairman of the state legislative committee which has started work on the program suggested by the national legislative chairman.

Iowa Dietetic Association. The semi-annual meeting of the Association will be held April 22 and 23 at the Fort Des Moines Hotel, Des Moines.

Ames group. Three meetings were held by a committee in the fall in an effort to organize a local group of dietitians, and on January 31 the first meeting of dietitians in the Ames took place at the home of Dr. Lillian Storms Coover. At this first meeting officers were elected and business matters discussed.

Dietitians of the *Des Moines* area were entertained by the staff of the Dietary Department of Iowa Methodist Hospital at the apartment of Kay Louise Johnson on October 1.

Kentucky Dietetic Association. On March 21 and 22, the Kentucky Dietetic Association held its annual meeting at the Home Economics Building, University of Kentucky, Lexington. The program was as follows: "Making Nutrition Practical" by Janet Cameron, Virginia Polytechnic Institute; "When We Work with Other People" by Clark Kizzia, General Foods Corporation, New York: "New Developments in Equipment for Food Preparation" by Margaret Gillam, American Hospital Association; "Nutrition at Work" by Helen A. Hunscher, Western Reserve University and President-elect of A.D.A.; and "Flower Arrangement" by Cissy Gregg of the *Courier-Journal*, Louisville.

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Maine Dietetic Association. The winter meeting of the Association took place at the apartment of Isabel Patterson in Augusta on January 25. Two projects to be undertaken this year are to try to interpret to high school girls the profession of dietetics and to try to cooperate with the hospitals giving student nurses training courses in dietetics and diet therapy. A spring meeting will be held in May.

Massachusetts Dietetic Association. The March meeting was held in connection with the New England Hospital Assembly on March 25 at the Statler Hotel, Boston. Margaret Gillam, American Hospital Association, spoke on "New Developments in Food Service Equipment," and her paper was later discussed by W. W. Wahl, manager of the New England branch of S. Blickman, Inc. George Bugbee, executive director of the American Hospital Association, talked on "The Administrator and the Dietary Department"; his address was discussed by Effie May Winger, chief dietitian, New England Deaconess Hospital, Boston.

Minnesota Dietetic Association. The fall meeting of the Association was held at Duluth on November 2 at the Hotel Duluth, at which time reports of the A.D.A. convention were made. Guest speaker was Mr. Fox, assistant administrator, St. Luke's Hospital, Duluth, who spoke on "The Hospital's Place in the Community. At the December board meeting it was decided that the Association would purchase 100 copies of *Dietetics as a Profession* and 200 copies of *Dietitians Are Urgently Needed* for distribution throughout the state.

In February, Volume 1, Number 1 of the *Minnesota Dietetic News Letter* made its appearance. It is a mimeographed bulletin five pages long and is being sponsored by Sister M. Bernadette, College of Saint Teresa, Winona. It will be issued at unspecified intervals, depending upon available news material and response of members.

Rochester Dietetic Association. A picnic at Kutzky Park was held in September. This fall picnic is an annual event at which new dietitians in the city are introduced. At the December meeting held at the Mayo Foundation House the film "Frozen Freshness," put out by General Motors Corporation, was shown.

Head of Lakes Dietetic Association. The November and December meetings were devoted to work on the revision of the diet manual used in Duluth hospitals. The group plans to continue work on this project during the year.

Twin Cities Dietetic Association enjoyed the film, "Frozen Freshness,' at its December meeting held at Eitel Hospital.

New York State Dietetic Association. The tentative program for the Lake Placid Convention, May 22 and 23, has been received in the JOURNAL office. It includes a meeting on administration, at which Kathleen Jeffs, supervisor of restaurants, T. Eaton Company, Montreal, will speak, as well as Margaret Gillam, American Hospital Association, and representatives of S. Blickman, Inc., and the Hobart Company. Mary Murphy, director, Elizabeth McCormick Memorial Fund, Chicago, and Catherine Leamy, consultant in nutrition, Children's Bureau, are scheduled to talk on community nutrition. Speakers for the Professional Education Section will include Mabel Flanley who will speak on "Public Relations and the Dietitian," and Helen E. Chase, personnel analyst, New York State Civil Service Department, whose topic will be "Improved Personnel Policies." Other speakers and their topics will be announced later.

Greater New York Dietetic Association. At the meeting on January 6 at Einhorn Auditorium, Lenox Hill Hospital, Orpha Mae Thomas, Teachers College, Columbia University, discussed the application of the principles of time and motion study to quantity food service. The Mary Swartz Rose Memorial sponsored annually by the Association was held on February 3 at the New York Academy of Medicine. The speaker was Dr. Carl V. Moore, professor of medicine, Washington University, St. Louis, who spoke on "Folic Acid in the Treatment of Macrocytic Anemias."

Ohio Dietetic Association. The annual spring meeting of the Association is planned for April 25 in Dayton. An interesting program is expected, with talks on equipment, diet therapy, personnel management, and administration problems. Some of the topics scheduled are: "Use of the Short Method of Dietary Evaluation"; "Present Trends in Diet Therapy"; "The Requirement of the Hospital Dietary Department for Paper Goods"; "Plastics: Their Use in the Hospital Dietary Department"; and "Methods of Employee Education in Sanitary Aspects of Food Handling."

Akron Dietetic Association. The November meeting was held at the Mayflower Hotel, with Ruth Joy, director of home service, East Ohio Gas Company, as hostess. Reports on the A.D.A. Cincinnati meeting were made. Dorothy Oestrike served as hostess for a Christmas party at Children's Hospital on December 19.

Cincinnati Dietetic Association. A "Food Parade" of their favorite recipes was enjoyed by Cincinnati dietitians at their February meeting. Guest speaker, Winifred Eliason, drew their attention to the need for more clearly defined food standards. Dr. Eva Donelson, Ohio State University, spoke at the March meeting and explained the use of the short method of dietary analysis.

Oklahoma Dietetic Association. The new officers for 1946–47 are: President, Marguerite Ross, College Food Units, Oklahoma A. & M. College, Stillwater; President-elect, Lucy Woodson, Chamber of Commerce, Oklahoma City; Vice-president, Laura Miller, University of Oklahoma, Norman; Secretary, Mary Leidigh, Oklahoma A. & M. College; and Treasurer, LaVon Thompson, Dairy Council, Oklahoma City.

Plans have been completed for the annual spring convention of the Association to be held April 11 and 12 in Oklahoma City at the Skirvin Hotel. Oklahoma dietitians, together with home economists, have been doing a great deal of work contacting state senators and representatives about a bill for the enrichment of flour and bread.

At Oklahoma A. & M. College, on February 6, the Home Economics Department honored Nell Clausen, past-president of A.D.A., at a dessert party. Miss Clausen briefly discussed the opportunities and current problems in the dietetic profession.

Utah Dietetic Association. The regular monthly meeting for February was held at the Dr. Groves Latter-Day Saints Hospital, Salt Lake City. Dr. Leigh, retired Army dentist, talked on "The Effect of Stabilized Diets on the Dentition." His talk dealt with his research on four tribes of Indians—the Iriquois, Zuni, Sioux, and Algonquin. The annual state meeting of the Association will be held April 15. Bertha Biltz, Administrative Adviser of A.D.A. is expected to take part in the program.

News about Members

The following A.D.A. members have recently accepted new positions or appointments:

Frances Adlis has left Gillette Hospital, St. Paul, and is now a member of the Home Economics Department of Oklahoma College, Chickasha, Oklahoma.

Dorothy Jones Barnes has moved from Waukegan Illinois, to accept a position at Cushing Memorial Hospital, Leavenworth, Kansas.

Ansta Todd Barr has left the Arizona State Department of Health, Phoenix, for a position as head of the nutrition section of the Children's Bureau, Dallas branch.

Mildred Johnson Bean is the new ward teaching dietitian

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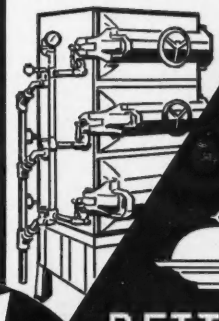

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at Massachusetts General Hospital, Boston. She recently completed her work as dietetic intern there.

Barbara Birkland, formerly at Grasslands Hospital, Valhalla, New York, is now on the Dietary Department staff at Rochester General Hospital, Rochester, New York.

Ann Blais is now dietitian in charge of private floors at Beth Israel Hospital, Boston.

Ella Bodal, who served with the Army in the South Pacific, is now dietitian at Children's Hospital, Honolulu.

Bertlyn Bosley has resigned her position with the State Board of Health, Raleigh, North Carolina, to accept a position in the Home Economics Department, Woman's College, Greensboro, North Carolina.

Ruth A. Boyd, recently released from the Army, is now on the dietary staff at St. Mary's College, Xavier, Kansas.

Katharine Brown has accepted a position as director of home economics, Pet Milk Company, St. Louis.

Anne G. Bryson, previously on the staff at Baptist Memorial Hospital, Knoxville, is now at the New York Hospital, New York City.

Mary Buchanan recently became assistant dietitian at Decatur and Macon County Hospital, Decatur, Illinois.

Delores Buckey became the new assistant dietitian at Leahi Hospital, Honolulu, following her resignation from the Huron Road Hospital, East Cleveland, Ohio.

Doris Burns, a former dietetic intern at The Food Clinic, Boston Dispensary, is now teaching child health and nutrition there.

Ethel Casey is now supervisor of the lunch program for the Jefferson Center School, Whitley County, Indiana.

Florence E. Caswell recently began her work for the International Petroleum Company, Ltd., in Talara, Peru. She was formerly on the staff at the U. S. Marine Hospital, Stapleton, Staten Island, New York.

Margaret Paschal Chapman has joined the staff at Ochsner Foundation, New Orleans. Until recently she was employed at Michael Reese Hospital, Chicago.

Shirley Clark has joined the dietary staff at New England Deaconess Hospital, Boston, as therapeutic dietitian.

Helen Claire Conway has resigned her position as administrative dietitian at Drexel Institute, Philadelphia, to become a nutritionist for the New York City Health Department.

Elizabeth Crozier has resigned her position at Teachers College, Columbia University, New York City, and is living in Toronto, Canada.

Helen Dempsey is now assistant to the director of institution management, Mills College, Oakland, California.

Helen Louise Dietz, a recent graduate of the approved course at Indiana University Medical Center, Indianapolis, is now dietitian at Tacoma General Hospital, Tacoma, Washington.

Harriet J. Dillard is the new administrative dietitian in the East Bay Cafeteria at Massachusetts General Hospital, Boston.

Margaret B. Doughty became director of the Home Service Department, Bendix Home Appliance, Inc., South Bend, Indiana, on February 15. She was formerly head of the Household Equipment Department, Washington State College, Pullman.

Elizabeth A. Douglass has resigned as dietitian at the College of William and Mary, Williamsburg, Virginia, to accept a position at Polyclinic Hospital, New York City.

Ella Marie Eck, formerly supervising dietitian at Dinsmore and Company, Chicago, is now acting director of the Dietary Department, University of Chicago Clinics.

Hilda M. Fall has left the Veterans Administration, Toronto, Canada, to accept a position at Hotel Dieu Hospital, Beaumont, Texas.

Kathryn Fason is now assistant administrative dietitian at Miami Valley Hospital, Dayton.

Helen E. Finch has accepted a position as cafeteria dietitian at St. Luke's Hospital, Cleveland. She was recently released from the Army after three years' service.

Dorothy Foushee, formerly at Beth Israel Hospital, Newark, New Jersey, is now a member of the Dietary Department, Watts Hospital, Durham, North Carolina.

Ruth Franklin has a new position at Mayo Clinic, Rochester, Minnesota.

Claire Marie Gerhardt, following completion of her student training at University Hospital, Cleveland, has been appointed assistant therapeutic dietitian at that institution.

Barbara Glagovsky is now the dietitian in charge of dining rooms at Beth Israel Hospital, Boston.

Miriam Grizzell is the new assistant administrative dietitian at Children's Hospital, Boston.

Mary T. Hansel is relief dietitian at Miami Valley Hospital, Dayton. She recently completed her dietetic interning at Brooke General Hospital, Ft. Sam Houston, Texas.

Marian Hardell recently accepted a position as head dietitian, Robert Breck Brigham Hospital, Boston.

Eleanor Harrison, formerly with the armed services, has joined the dietary staff at Queen's Hospital, Honolulu.

Clare A: Hoffmeister is now employed as cafeteria manager for Scruggs-Vandervoort-Barney, Inc., St. Louis.

Betty Ruth Houser recently resigned as assistant dietitian at the California Hospital, Los Angeles, to accept a position as home economist for D. E. Sanford Company, Los Angeles.

Margaret Hunsicker, formerly at City Hospital, Akron, Ohio, is now teaching diet therapy at the University of Akron.

Juanita Jack is the new therapeutic dietitian, Mercy Hospital, Sacramento, California.

Doris Jackson has joined the staff at New England Hospital, Boston, where she is therapeutic dietitian.

Grace E. Johnson, who recently resigned her position at Ventura County Hospital, Ventura, California, is now at Cottage Hospital, Santa Barbara, California.

Barbara Jones, following her graduation from the dietetic intern course at University of Michigan Hospital, Ann Arbor, became assistant dietitian at Shannon West Texas Memorial Hospital, San Angelo, Texas.

Virginia Jones, former Army dietitian, has joined the staff at Peoples Hospital, Akron, Ohio.

Martha Kawabata, a recent graduate of the Cincinnati General Hospital dietetic intern training course, is now assistant dietitian, Kuakini Hospital, Honolulu.

Sara Kiel is now at Presbyterian Hospital, Philadelphia. Until recently she was at Children's Hospital, Philadelphia.

Corrine King has left Baldwin Wallace College, Berea, Ohio, to become resident manager, College Club, Cleveland.

Barbara Kline has become therapeutic dietitian, Colorado State Hospital, Pueblo.

Rosemarie Kutas, formerly at Tammen Hall, Denver, is now administrative dietitian, Children's Hospital, Denver.

Joanna Lager, recently released from the Army, is now on the staff of Colorado State Hospital, Pueblo.

Catherine Leamy, formerly overseas with the Red Cross, is now with the Children's Bureau, Federal Security Agency, as head of the nutrition section in New York City.

Aura Louhi has resigned her position at the Hospital of the Good Shepherd, Syracuse, New York, and is now chief dietitian, Henry Heywood Memorial Hospital, Goodner, Massachusetts.

Betty Ann Margulis, formerly at Beth Israel Hospital, Boston, is now administrative dietitian, Ancker Hospital, St. Paul.

Margaret Hauck Matheson is now at Bellevue Hospital, New York City.

Elizabeth J. McIntyre has accepted a position at St. Anthony Hospital, Oklahoma City. Formerly, she was employed at Jefferson Davis Hospital, Houston.

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M. Louise McKenney resigned as assistant dietitian, Johns Hopkins Hospital, Baltimore and is now on the staff at Alfred I. DuPont Institute, Wilmington, Delaware.

Miriam Meading is a new member of the staff at West Nebraska Methodist Hospital, Scottsbluff, Nebraska. She was formerly on the staff at Methodist Hospital, Houston.

Dolores F. Moore is a new member of the staff at Winfield Sanatorium, Winfield, Illinois.

Barbara Northrup has been appointed assistant dietitian at St. Francis Hospital, San Francisco.

Marjorie O'Brien has resigned her position at Cook County Hospital, Chicago, to become a member of the staff at South Shore Hospital, Chicago.

Rebecca Parkhurst recently joined the dietary staff at Norwalk General Hospital, Norwalk, Connecticut.

Elizabeth Ann Porter, formerly employed by the Division of Nutrition, Department of Health, Havertown, Pennsylvania, is now with the New Jersey Department of Health, Bureau of Preventive Diseases, Trenton, New Jersey.

Avonelle Purdy is now on the staff at Peoples Hospital, Akron, Ohio.

Lottie M. Reed recently resigned her position as chief dietitian at Cottage Hospital, Santa Barbara, California.

Ann Ross is now administrative dietitian at New England Deaconess Hospital, Boston.

Frances Louise Saunders was recently appointed assistant dietitian, Dover Annex, Wellesley College, Wellesley, Massachusetts.

Bernice Schoelen is now employed by Dr. George Piness in Los Angeles.

Dorothy Singer, upon completion of her training at St. Louis University Hospitals, became dietitian in charge of the nurses' pay cafeteria, Miami Valley Hospital, Dayton.

Sister Maud North has been transferred from the Providence Hospital, Washington, D. C., to Allegany Hospital, Cumberland, Maryland.

Alice Hardimon Smith has resigned as nutrition consultant for the Michigan Department of Health, Lansing, to accept a position as head of the nutrition section of the San Francisco branch office of the Children's Bureau, Federal Security Agency.

Helene Steigner has left Miami Valley Hospital, Dayton, and is now teaching diet therapy at the University of Akron.

Jane L. Stelter, formerly on the dietary staff at San Joaquin Hospital, Stockton, California, is now chief dietitian, Conemaugh Valley Memorial Hospital, Johnstown, Pennsylvania.

Elizabeth Stenborg, formerly assistant dietitian at Huntington Memorial Hospital, Pasadena, California, is now a member of the Dietary Department, St. Luke's Hospital, San Francisco.

Florence V. Stephens, recently released from the Army, is now at Stuart Circle Hospital, Richmond, Virginia.

Genevieve Sullivan is a new private floor dietitian at Boston Lying-In Hospital.

Barbara Tighe is now private patient dietitian, Michael Reese Hospital, Chicago. She was formerly employed at St. Anthony Hospital, Oklahoma City.

Ferne Mountz Tilton, who recently completed her dietetic internship at Peter Bent Brigham Hospital, Boston, is now on the staff at Memorial Hospital, Nashua, New Hampshire.

Patricia Tilton, formerly at Texas State College for Women, Denton, is now dietitian and home economics instructor at Radford School for Girls, El Paso, Texas.

Kathryn Tissue recently resigned her position as assistant professor of home economics, University of Kansas, Lawrence, to become a member of the staff of the School of Home Economics, Alabama Polytechnic Institute, Auburn.

Betty K. Totland, upon completion of her dietetic internship at Cook County Hospital, Chicago, became a staff dietitian at Montefiore Hospital, New York City.

Jacqueline Vincent has become teaching and therapeutic dietitian at St. Catherine's Hospital, Brooklyn, New York.

Bobbie Bell Ward is now employed at Barnes Hospital, St. Louis.

Annabel Watkins, recently released from the Army, is now assistant dietitian at Pennsylvania State Teachers College, Clarion.

Edith Wax, a graduate of the approved course at Beth Israel Hospital, Boston, has become head dietitian, Allerton Hospital, Brookline, Massachusetts.

Joanne Werick, having resigned her position at New York Hospital, New York City, is now dietitian at King's Daughters' Hospital, Portsmouth, Virginia.

Ellen Woodmansee is now employed by the nutrition clinic, Massachusetts General Hospital, Boston.

Else H. Zimmerman, formerly a dietitian in the Army, completed a three-month refresher course at Mt. Sinai Hospital, New York, and is now on the staff there.

Announcements of the following marriages of A.D.A. members have been received in the JOURNAL office:

Florence Bevins, recently released from the Army, is now Mrs. G. Melick, Jr., and is living in Morristown, New Jersey.

Annabel S. Bradfield has become Mrs. M. P. Tyar and is living in Madison, Wisconsin.

Elizabeth Cannon (**née Wilson**) has moved from Los Angeles to Santa Monica, following her marriage.

Mary Louise Davis is now living in New Hyde Park, New York, following her marriage to M. E. Nacket.

Mary Lou Eathorne is continuing her work at Santa Fe Hospital, Temple, Texas, following her marriage to Thomas Mahler.

Erika N. Heininger recently became Mrs. Alan Sawyer. The couple are living in West Roxbury, Massachusetts.

Margaret Helming was married on December 28, 1946, to Dr. W. R. Clifford, and has moved from Chisholm, Minnesota, to Guthrie Center, Iowa.

Bessie V. Hughes, following her marriage to N.E. Whaley, has moved from Conandiagua, New York, to Mountain Home, Tennessee.

Shirley L. Hughes, a recent graduate of the dietetic intern training course at Henry Ford Hospital, Detroit, has been married to James S. Ainslie, Jr., and is now living in Ithaca, New York.

Mary Janetos is now Mrs. George Bandouveres and is continuing to work at the New England Hospital for Women and Children, Boston.

Irene Jardine (**née Lofftus**) has resigned her position with St. Luke's Hospital, New York, and has moved to Roseville, Illinois, following her recent marriage.

Helen Josephine Jennings is now Mrs. Woodrow A. Pomykal.

Shirley Jolly (**née Gardner**) is now living in Alameda, California.

Janice Kauffman, following her marriage to T. V. Sparrow, Jr., has moved from Dayton, Ohio, to Blue Island, Illinois.

Cathryn Jean Louis (**née Bacon**) was recently married and is working at Southeast Missouri Hospital, Cape Girardeau, Missouri.

Marjorie Louis, formerly dietitian at St. Francis Hospital, Poughkeepsie, New York, was married on March 16 to Merrill S. Golden and is now living in New Milord, Connecticut.

Vera J. Mima Lowenbach was married in February to Karel Bala.

Eleanor M. Wilkinson became the bride of Lisle E. McCarl at Annapolis, Maryland, on January 27. Mrs. McCarl was recently appointed head of the nutrition section of the Chicago branch office of the Children's Bureau, Federal Security Agency.